# AMATEUR RADIO

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## CO-ORDINATED DEVELOPMENT

Elsewhere in this issue you will find the doings of Federal Headquarters since the Convention six months ago. Time has advanced rapidly since that date and there has been much work to be done—quite a lot of it routine and a goodly part progressive work. We aimed firstly at obtaining the re-instatement of the rights of the Hams. Secondly we aimed at putting "a head" onto the W.I.A. to give it a Federal Constitution by which the future functions of the Amateur movement in Australia depend and so that we can truly represent the Amateur and speak as one voice, to preserve the rights and privileges of the movement, and thirdly to improve existing circumstances. Whether we have achieved very much can best be left to you to judge.

The W.I.A. has earned for itself recognition as the mouthpiece and accepted administrative controlling body of Amateurs in Australia. The Disposals Commission recognised the W.I.A. by offering service equipment to amateur members at liberal prices. Nearly all the Radio Trade provides discounts to Institute members. We doubt very much whether the Radio Inspectors' Branch would have granted extended privileges in the form of additional frequency assignments and operating conditions to anybody but one that is truly representative of the licencees.

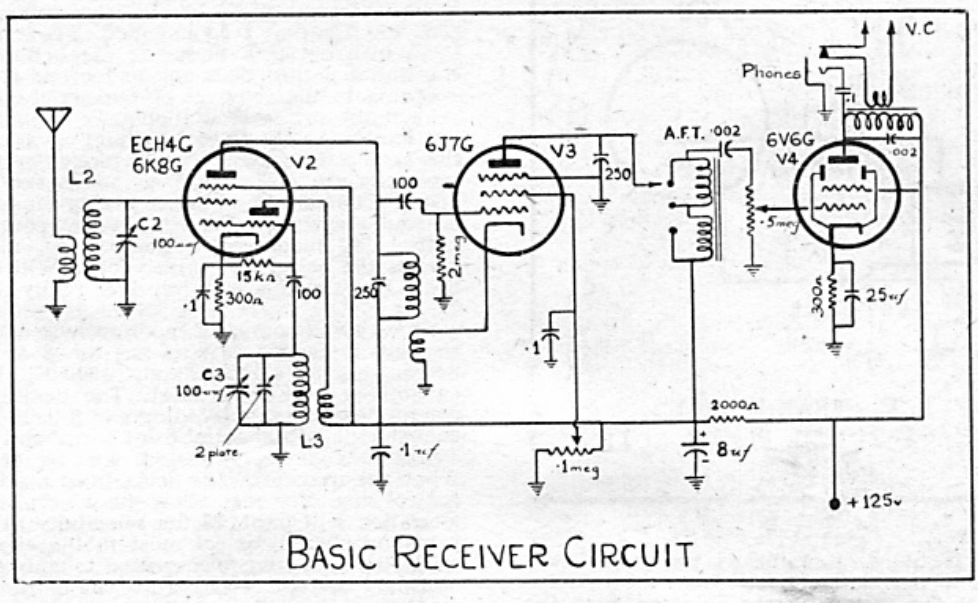
There is much work to be done but we are now equipped to do it. The work of F.H.Q. is now to be centered around the development and advancement of standards of amateur radio, technically and administratively. Co-ordination of activities and development will be the key to the future. It is for the W.I.A. to lead these developments in this country and the co-ordination must originate from Federal Headquarters as it is the source of contact with international societies, scientific bureaux and authorities in allied arts.

**R.H.C.**

## IN THIS ISSUE

# A SIMPLE HAM RECEIVER

**By J. Brown, VKJBJ***




BASIC RECEIVER CIRCUIT

Although the receiver to be described is simplicity itself, no apology need be made for its performance. As it was considered that an I.F. of 1600 Kc. was most suitable for a 28 Mc. receiver, the Two Valve Super shown in the A.R.R.L. Handbook was built up. However, this simple set, although adequate for headphone reception on the lower frequency bands, did not have enough punch on 28 Mc.

The first step in search of more gain was to replace the 6C8G combined second detector and audio with a 6J7-6V6 combination. This improved the sensitivity out of sight and made an ideal set for a new Ham, or an old one who does not want too much complication. A set of this type will be described first, and then the addition of an R.F. stage will be dealt with.

The circuit is shown in Figure 1 and a suggested layout in Figure 2. The spare space to the right is used to mount a code monitor for transmitter keying, the same chassis being used for the set with the R.F. stage. When the R.F. stage is not used, the space occupied by L1, C1 and V1 is left vacant. There is nothing unusual about the second detector-audio circuits, these merely being an ordinary two valve regenerative arrangement fixed tuned to 1600 Kc. or thereabouts, but attention to a few points makes a lot of difference to results. Firstly, owing to the tuned anode arrangement used, the ordinary tapped coil cathode feedback circuit cannot be used, and a separate cathode tickler coil must be used. This is really a preferable arrangement, as it enables a ready adjustment of turns in order to get extremely smooth control of regeneration, which makes all the difference to the results obtained. The feedback control is a potentiometer in the screen supply, and the number of cathode turns should be altered until the valve slides into oscillation at 30-40 volts on the screen. The grid is fixed tuned with a rather large mica condenser in order to give the maximum stability and selectivity. Suitable coil details are given in the table at the end of the article.

The other item of note is the coupling between the 6J7 and the 6V6. This consists of an audio transformer with the windings connected in series and, owing to the switching arrangement shown, it can be used either as a high impedance choke or a low impedance transformer. When it is used as a choke, good phone quality is obtained, whilst as a transformer working out of a pentode it gives a peaked response suitable for C.W. For the Philips transformer used, the P and G should be connected together.

Owing to the extremely high gain of this portion of the circuit, care has to be taken to eliminate hum and feedback. The plate leads of the 6J7 and the grid leads of the 6V6 are run in shielded wire, the grid lead to the 6J7 is run in low capacity shielded cable (braid over spaghetti with a small wire inside) and the grid leak and condenser are shielded with a metal box. The 2,000 ohm resistor and the 8 mfd. condenser provide decoupling, in the absence of which feedback may occur owing to the tuned anode circuit effectively coupling the grid of the 6J7 to the power supply for the higher audio frequencies.

The converter valve is the heart of the set and, although it may have been due to the valves tried not being representative of their type, the ECH4G and the 6K8G were the only ones that worked satisfactorily on 28 Mc. The new ECH35G will probably also be OK. Whilst the ECH4G did not seem to have any snags and worked first try, the 6K8G needed some taming. Two troubles seem to be in evidence with the 6K8G at 28 Mc., firstly the oscillator portion tends to superregenerate and, secondly the 6K8G has a negative input conductance at 28 Mc. which provides the same effect as regeneration and may become high enough to cause an efficient grid circuit to break into oscillation. The first trouble was overcome by using a 15,000 ohm gridleak for the oscillator instead of the 50,000 ohm usually used here and the second, if it occurs, may be overcome when a R.F. stage is being used by loading the 6K8G grid tuned circuit with a resistance of 10,000 ohms or more. If a R.F. stage is not in use simply increase the aerial coupling.

In practice the 6K8G, once tamed, seems to be the more satisfactory as, although it gives slightly less gain and signal/noise ratio, its ability is much higher. At 28 Mc. the ECH4G is very sensitive to changes of oscillator voltage and is also subject to a large amount of pulling when

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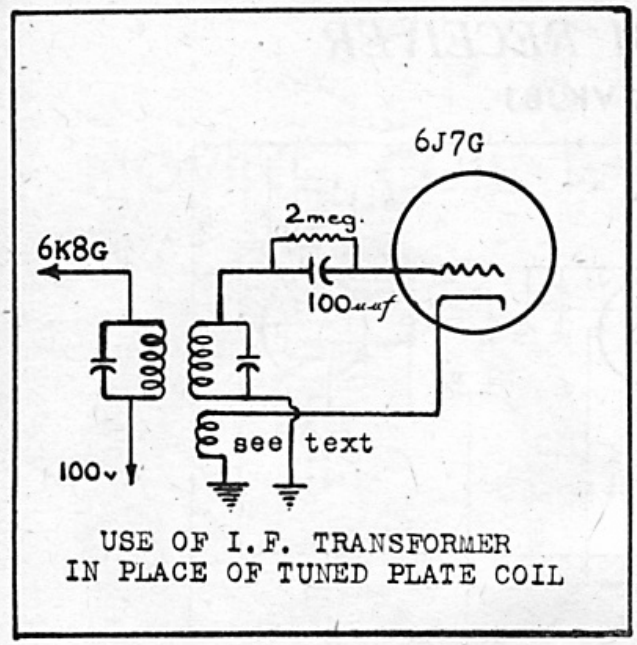



USE OF I.F. TRANSFORMER
IN PLACE OF TUNED PLATE COIL

the grid circuit is tuned, this makes tuning difficult. The 6K8G seems to be relatively free from these faults. It was found that the best gain was obtained from the ECH4G when the oscillator was on the H.F. side of the signal, but for the 6K8G it should be on the L.F. side (for 28 Mc. at any rate). The oscillator grid current for both valves should be about ½ Ma. through 15,000 ohms. To obtain the best results from the regenerative feature of the 6K8G, the aerial coupling should be looser than when the ECH4G is used, and should be experimented with until the best results are achieved. In both cases the heater voltage is very critical and it must not be allowed to drop below 6 volts or else the gain drops right off.

Separate band-set condensers are used for the aerial and the oscillator circuits, the aerial condenser being driven by an Eddystone slow motion coupling. In order to get the shortest possible leads in the R.F. circuits, the aerial is mounted on the top of an aluminium bracket, the tuning condenser being mounted on the front of the bracket; the oscillator coil is mounted direct on the chassis and its tuning condenser is underneath. For band-spread, a small condenser is shunted across the oscillator coil only. When the receiver is needed for the lower frequency bands, it is proposed to use a condenser here large enough to spread the 3.5 Mc. band across the dial, and then for the higher frequencies this condenser would be tapped down on the coil so as to spread these bands over the dial also. As the receiver has not yet been used on the lower frequency bands, these details cannot be given, but they may easily be obtained by experiment. For the main tuning dial, a small cord-driven job was obtained and the driving shaft with the V groove in it was replaced by a piece of ¼-inch ebonite rod with no groove. The absence of the groove gives much smoother operation and the ebonite shaft stops contact noises which may be troublesome on 28 Mc. For the same reason the main bushing of the dial is replaced by an ebonite one, these two alterations turn the dial into a first class unit.

Although the receiver without the R.F. stage is excellent for headphone work, it has not got enough gain for loudspeaker work except on strong signals. In order to remedy this a stage of R.F. was added in preference to a stage of I.F., as the R.F. stage greatly improves the inherent signal noise ratio. The three valve job will reproduce loudly any signal that is above the converter hiss and an I.F. stage would not improve the situation as it would make both the signal and the noise louder. The R.F. stage, however, amplifies the signal without increasing the converter hiss and so improves the signal/noise ratio. A 6K7 was used here, but the other conventional types would also be satisfactory. If obtainable, the newer types 6SK7 or 6SG7 are much better, but the 1852/6AC7 is not recommended. For the fortunate few the Acorn or 9000 series are ideal, but on 28 Mc. the conventional tube does not do too bad a job.

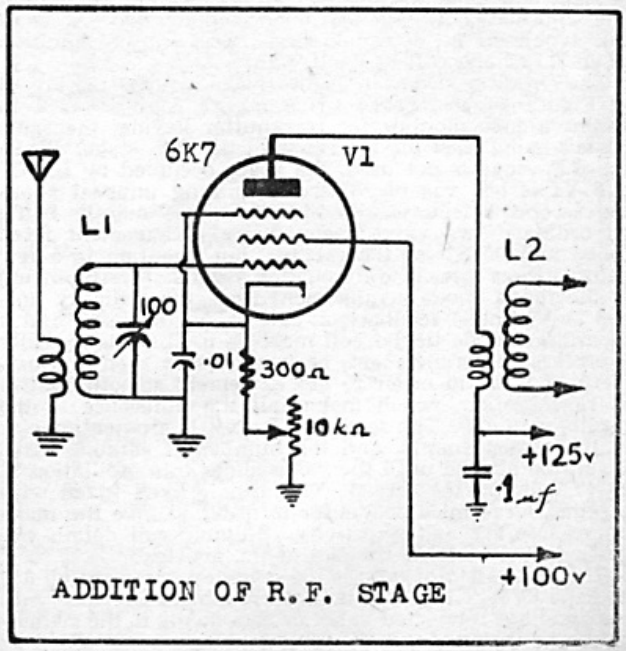
Owing to the removal of the aerial loading from the grid of the mixer oscillation may occur with the 6K8G, but can be easily fixed by shunting a resistance across the grid coil as mentioned before. For this reason low loss coils are not always an advantage for use with a 6K8G. The aerial and mixer tuning condensers are ganged and driven by the Eddystone reduction as before, both being mounted on the bracket and shield which carries the aerial and mixer coils. With the addition of the R.F. stage this little receiver really does perform on 28 Mc.

There are a couple of modifications which can be carried out if desired. Firstly the tuned anode circuit may be replaced by a conventional 1600 Kc. I.F. transformer (a number 1 is preferable). The tickler coil should be wound near the grid winding and 5 to 10 turns should be enough, the actual number of turns and the polarity of connections being adjusted for correct regeneration. When the transformer is being lined up, the regeneration control should be just below the point of oscillation. This alteration will improve the selectivity at the expense of gain and should appeal most to the city dweller. Secondly the A.F. transformer used to couple the 6J7 to the 6V6 may be replaced by a 250,000 ohms resistor without greatly affecting the results.

In wiring the set, make all leads direct and as short as possible. All earths for any particular valve should be returned to one point and these points joined together with heavy copper wire.

A power supply of 25 Ma. at 125 volts is required for the three valve version and 35 Ma. at the same voltage for the 4 valve set.

All the coils except the 28 Mc. aerial and mixer coils are wound on ordinary valve bases, these 28 Mc. coils




ADDITION OF R.F. STAGE

(Continued on Page 25).

# SELECTIVITY

The increase in the popularity of the higher frequencies has demanded a somewhat new and more intricate approach to receiver design. Much has been written about H.F. technique and its inherent problems but little has been said about that portion of the receiver which supplies the selectivity—referring of course to the I.F. channel of a superheterodyne. It will not be the object of this article to deal with any specific I.F. channel but rather to dwell on the general concepts of selectivity and enable the individual to design according to his own requirements and conditions.

First let us look at the requirements of selectivity and to set down some of the standard characteristics as used in selectivity measurements. Selectivity is invariably obtained by the use of resonant circuits. These may consist of inductance capacitance combinations, piezo-electric crystals or other vibrational devices but at this stage we will concentrate on the coil condenser combination being the most universally used for this purpose. When a coil and condenser are used in the well-known parallel resonance circuit they show an impedance characteristic as illustrated in Fig. 1. The impedance is maximum at the resonant frequency of the coil and condenser and falls off on either side. Thus in a receiver this parallel resonant circuit can be used to make the amplification of a valve vary with frequency proportional to the variation in the circuit impedance. The characteristic of the circuit is measured in terms of the ratio of the voltage gain at resonance to the gain at some frequency off resonance, this usually being taken at a number of spots. In actual practice the gain is usually referred to by the signal input required to give some standard output and the ratio is given by the voltage input off resonance divided by the voltage input at resonance. Also this ratio is given in DB as this is more suited to the logarithmic characteristic of the ear and the number of Kc/s. off resonance given in terms of total bandwidth which is twice the Kc/s. off resonance assuming a symmetrical curve.

Our selectivity curve has to fill a number of requirements, the first of which is its ability to handle the modulation of the incoming signal. From this point of view it must have a finite width which is dictated by the highest modulation frequency it has to pass. This is because of the sidebands generated in the process of modulation and which actually contain the intelligence. For this purpose a certain maximum attenuation is allowable in sideband cutting and for normal purposes this is set at 6 DB. Secondly, the selectivity curve must supply sufficient attenuation of adjacent signals to enable the desired signal to be heard without interference. For practical purposes this attenuation is set at a minimum of 60 DB. These two figures are the most important ones concerning any selectivity curve and the ratio of the bandwidth at 60 DB to the bandwidth at 6 DB is referred to as the shape factor. Thus the design of the circuit is towards a shape factor as small as possible tending ultimately towards the hypothetical perfect with a shape factor of 1.

### THE DEVELOPMENT OF AN I.F. CHANNEL

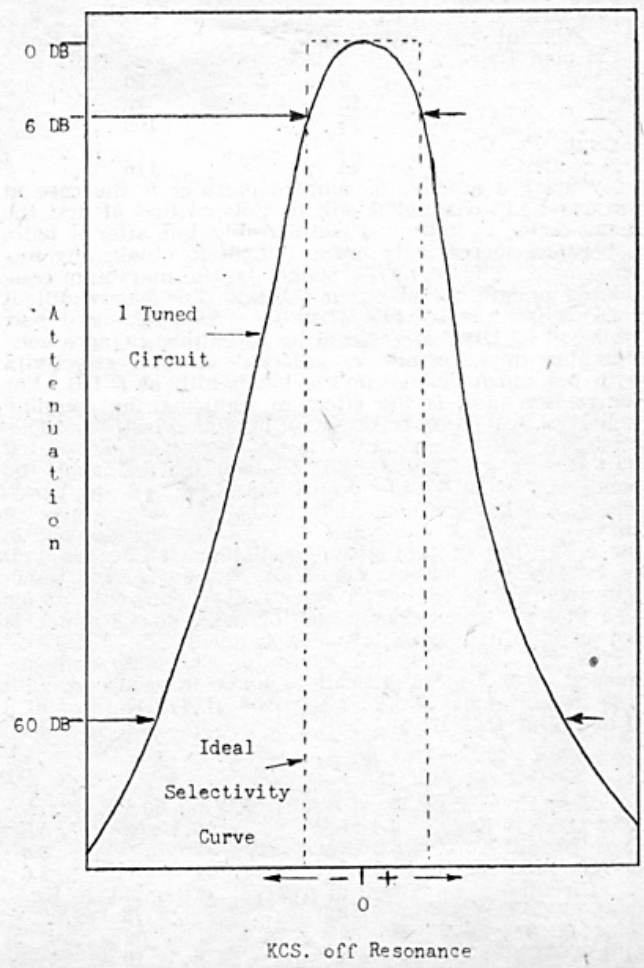
In studying more fully the characteristics of tuned circuits it will be necessary for the moment to use a much lower attenuation figure than 60 DB as this cannot be satisfactorily obtained with a small number of circuits. We will therefore use 15 DB to enable us to compare various combinations. The width of the curve is a function of the Q of the coil, the higher the Q the narrower the curve, and the Q is the effective working Q and not the initial value of the coil on its own as this value is reduced by the losses in the condenser and insulation and the loading of the accompanying valves and circuits and might only be a fraction of its initial value. Therefore any future reference to Q will be this effective value and not the initial value.

The following Table 1 will give a comparison of 1 tuned circuit, 2 tuned circuits with zero coupling (i.e. coupled through a signal transferring device such as a valve), 2 tuned circuits reactively coupled at one half critical and 2 tuned circuits critically coupled, each circuit having a Q of 130 and tuned to the standard frequency of 455 Kc/s.:—

**TABLE 1**

| Circuit | B.W. at 6 DB | B.W. at 15 DB |
|---|---|---|
| 1 Circuit .... .... .... .... | 6.0 Kc/s. | 20 Kc/s. |
| 2 „ zero coup. .. | 3.4 „ | 7.5 „ |
| 2 „ .5 x Crit. .. | 4.2 „ | 8.6 „ |
| 2 „ 1.0 x Crit. .. | 6.5 „ | 11.5 „ |
| Circuit | Attenuation at 6 Kc/s. B.W. | Attenuation at 20 Kc/s. B.W. |
| 1 Circuit .... .... .... .... | 6 DB | 15 DB |
| 2 „ zero coup. .. | 12 „ | 30 „ |
| 2 „ .5 x Crit. .. | 10 „ | 29 „ |
| 2 „ 1.0 x Crit. .. | 4.6 „ | 24 „ |

The value of Q at 130 has been used as this is a reasonable approximation of the maximum value that can be obtained under working conditions in present day coils at this frequency. It will be noticed from these figures that with two single circuits as would be used in the R.F. section of a receiver the attenuation at any



given bandwidth is equal to the attenuation of the one circuit multiplied by the number of circuits. Thus in obtaining adequate adjacent channel selectivity by the use of a number of single circuits the selectivity curve becomes very sharp on the nose. By coupling two circuits together reactively we get a new set of conditions in which the shape of the curve is altered in relation to the two separated circuits. It will be noticed that the general curve is somewhat broader but it has the desirable effect of having the bandwidth at any point increased by the same amount approximately. This results in an improvement in shape-factor as the percentage increase in bandwidth at 6 DB is 91%—3.4 Kc/s. to 6.5 Kc/s.—while at 15 DB is only 53%—7.5 Kc/s. to 11.5 Kc/s.—and becomes progressively less as the attenuation becomes greater. These figures are for critical coupling which is the condition just before the familiar appearance of the double peaks of over-coupling. For practical purposes it is not desirable to use coupling beyond critical due to the difficulty of alignment without special equipment. Refer to Fig. 2.

Table 2 shows the effect of using a number of coupled pairs, each coil with a Q of 130 at a frequency of 455 Kc/s. and each coupled to critical.

**TABLE 2**

| Circuit | B.W. at 6 DB | B.W. at 60 DB | Shape-Factor |
|---|---|---|---|
| 1 Coupled Pair .... | 6.5 Kc/s. | 160 Kc/s. | 25 |
| 2 „ „ .... | 5.0 „ | 28 „ | 5.6 |
| 3 „ „ .... | 4.4 „ | 16 „ | 3.6 |
| 4 „ „ .... | 4.0 „ | 11.6 „ | 2.9 |
| 4 Coup. Pr. Coup. .5 x Crit. .... .... | 2.1 „ | 8.8 „ | 4.2 |

| Circuit | Atten. at 6 Kc/s. | Atten. at 20 Kc/s. |
|---|---|---|
| 1 Coupled Pair .... | 5 DB | 25 DB |
| 2 „ „ .... | 9 „ | 50 „ |
| 3 „ „ .... | 13 „ | 75 „ |
| 4 „ „ .... | 17 „ | 100 „ |
| 4 Coup. Pr. Coup. .5 x Crit. .... .... | 24 „ | 116 „ |

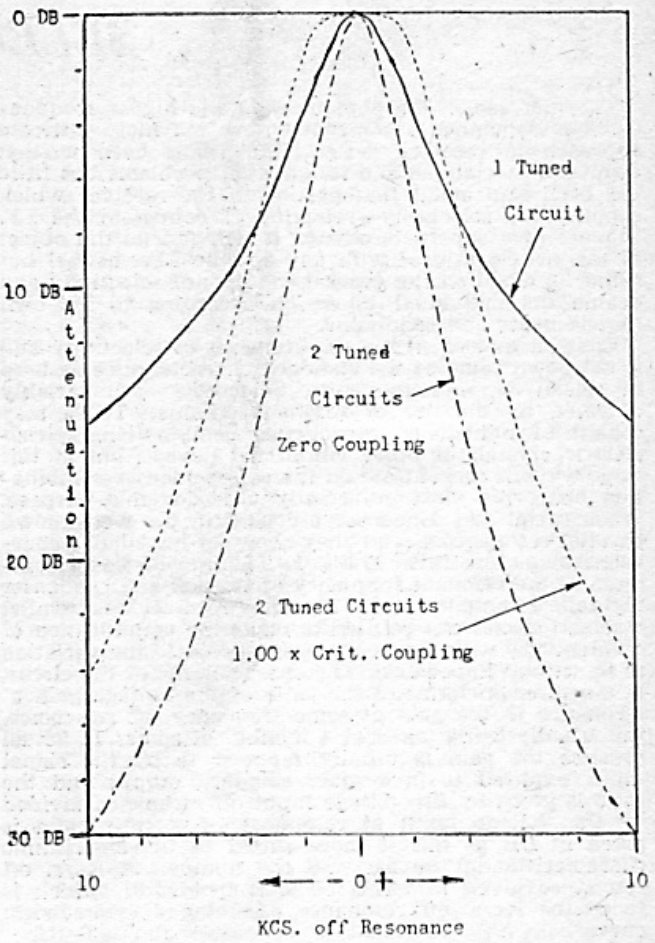
By using a number of coupled pairs as is the case in the usual I.F. channel it will be noticed that at first the shape-factor is improved considerably but after 3 pairs it becomes increasingly more difficult to obtain any improvement. Thus 4 I.F.Ts. should be the maximum considered under normal circumstances. The bandwidth at 6 DB is reduced by 40% with 4 pairs as against 1 pair whilst at 60 DB it is reduced by 93% thus giving a considerable improvement in adjacent channel selectivity with not much change in the bandwidth at 6 DB. For comparison also, is the effect of reducing the coupling to half critical in order to obtain greater selectivity. This method is often used but it is not personally advocated if it can be avoided. It will be seen that although the bandwidth at 60 DB has been reduced by 24% the bandwidth at 6 DB has been reduced by 47% which gives a curve so sharp on the "nose" as to cause an increase in the difficulties of tuning and oscillator stability as well as considerable audio attenuation without giving much improvement in adjacent selectivity. You will notice also that the shape-factor has increased to 4.2 which is not as good as 3 pairs critically coupled.

Next we will study the effects of altered Q and frequency using 3 pairs critically coupled in each case with a Q of 130 at 455 Kc/s., a Q of 65 at 455 Kc/s., and a Q of 130 at 1820 Kc/s.

**TABLE 3**

| Circuit | B.W. at 6 DB | B.W. at 60 DB | Shape-Factor |
|---|---|---|---|
| Q of 130, 455 Kc/s. | 4.4 Kc/s. | 16 Kc/s. | 3.6 |
| Q of 65, 455 Kc/s. | 8.8 „ | 32 „ | 3.6 |
| Q 130, 1820 Kc/s. | 17.6 „ | 64 „ | 3.6 |

| Circuit | Atten. at 6 Kc/s. | Atten. at 20 Kc/s. |
|---|---|---|
| Q of 130, 455 Kc/s. | 13 DB | 75 DB |
| Q of 65, 455 Kc/s. | 1.6 „ | 39 „ |
| Q 130, 1820 Kc/s. | 0.4 „ | 10 „ |

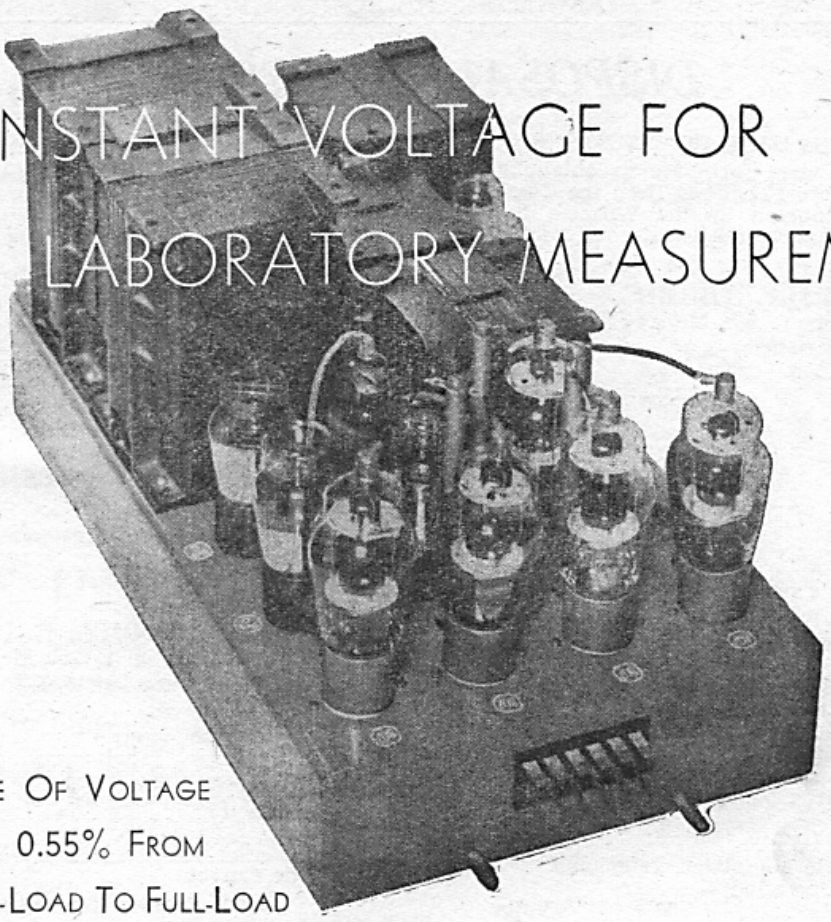



First note that the shape-factor is independent of the Q or frequency, being governed only by the number of tuned circuits and the degree of coupling. Second, the bandwidth is inversely proportional to the Q, the lower the Q the wider the bandwidth—reducing the Q by half gives twice the bandwidth—and third, the bandwidth is proportional to the frequency maintaining the same Q—increasing the frequency by four gives four times the bandwidth. Thus the use of an I.F. channel with a frequency of 1820 Kc/s. as against 455 Kc/s. would require a Q of 520 to give the same selectivity. In practice it is not possible to obtain figures anything like this, in fact it is difficult to obtain working Qs at 1820 Kc/s. any higher than that obtainable at 455 Kc/s. Therefore it must be born in mind that the use of higher I.F. frequencies will result in lower selectivity than that obtainable at 455 Kc/s. and it is not possible to completely solve this with more tuned circuits as the channel will be naturally broad and it is not possible to reduce the skirt to less than the nose bandwidth. It will be noticed that for the same Q at both frequencies the attenuation of a signal 10 Kc/s. off resonance at 455 Kc/s. will be 75 DB, but at 1820 Kc/s. would only be 10 DB and could not be regarded as sufficient as it is necessary to separate even better than 10 Kc/s. for amateur work.

All the figures quoted in this article are calculated and while they can be closely duplicated in practice with careful design, they do not take into consideration the effects of feedback which can have considerabe effect on the characteristics. Regeneration is one of the methods

(Continued on Page 26).

# CONSTANT VOLTAGE FOR LABORATORY MEASUREMENTS



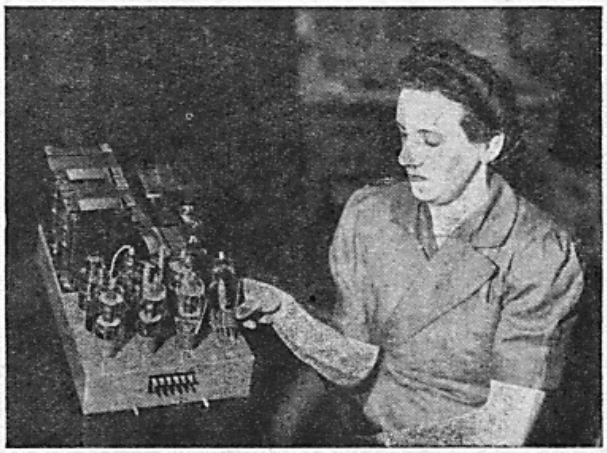
CHANGE OF VOLTAGE ONLY 0.55% FROM NO-LOAD TO FULL-LOAD

MANY testing processes require constant voltage to be applied to valves or other equipment during the time that the test is in progress. It is useless to have instruments correct within 1% or less if the voltage is going to vary while the current or other feature is being read.

This is particularly important in the testing of radio valves in which some of the characteristics are critically dependent upon the applied voltages. An example of this is the Characteristic Tester recently constructed in the Laboratory of Amalgamated Wireless Valve Co. Pty. Ltd. at Ashfield. This equipment is used for the checking of a percentage of all valves manufactured each day, to see that the accuracy of the factory testing is maintained, and to carry out other tests not normally applied to the whole production owing to their complexity.

The equipment uses an electronic voltage regulator on the plate, screen and grid supply voltages. The input is from the 240 volt A.C. mains, the output is variable in voltage from 0 to 300 volts with a maximum current of 200 mA. With the maximum output voltage, the percentage voltage drop is only 0.55% for a change of load from 0 to 200 mA.

The equipment uses Radiotron type 807 valves, four of which carry the current of 200 mA. between them. The 807 is probably the most satisfactory type of valve for this purpose owing to its high current capability (72 mA. per valve maximum) and its high amplification factor. This is only one of many applications in which Radiotron type 807 may be used with every satisfaction.



Radiotron

MADE IN AUSTRALIA

Advertisement of Amalgamated Wireless Valve Company Pty. Ltd.

# *DISPOSAL TUBES*

**TECHNICAL DATA AND BASE CONNECTIONS**

To those members who were fortunate in obtaining some of the tubes which were purchased from the Commonwealth Disposals Commission by the Wireless Institute, the following information will be of considerable interest.

## CV6—E1148 V.H.F. TRIODE

(Full Ratings up to 224 Mc/s.)

**Characteristics:—**

| | | |
|---|---|---|
| Heater Voltage | 6.3 | Volts |
| Heater Current | 0.175 | Amperes |
| Plate Voltage | 300 | Max. Volts |
| Plate Current | 20 | Max. Ma. |
| Plate Dissipation | 3.5 | Max. Watts |
| DC Grid Voltage | —35 | Volts |
| DC Grid Current | 4 | Ma. |
| Transconductance | 3000 | Micromhos |
| Amplification Factor | 20 | |
| Plate Resistance | 10000 | Ohms |

**Interelectrode Capacitances:—**

| | | |
|---|---|---|
| Grid to Heater | 1.4 | Mmfd. |
| Grid to Plate | 1.6 | Mmfd. |
| Plate to Heater | 1.2 | Mmfd. |

**Class C Amplifier and Oscillator**

Typical Operation:—

| | | |
|---|---|---|
| Plate Voltage | 300 | Volts |
| Grid Voltage | —35 | Volts |
| Plate Current | 20 | Ma. |
| Grid Current | 2.0 | Ma. |
| Driving Power | 0.4 | Watts |
| Carrier Power | 3.5 | Watts |

**Class C Amplifier Plate Modulated Telephony**

Typical Operation:—

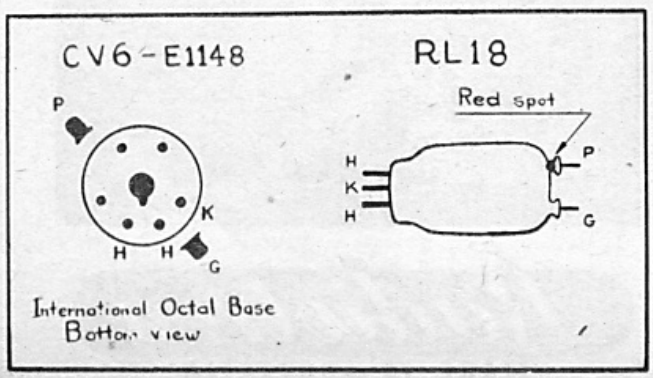
| | | |
|---|---|---|
| Plate Voltage | 300 | Volts |
| Grid Voltage | —35 | Volts |
| Plate Current | 20 | Ma. |
| Grid Current | 3.0 | Ma. |
| Driving Power | 0.8 | Watts |
| Carrier Power | 3.5 | Watts |

## RL18 U.H.F. TRIODE

(Full Ratings to 600 Mc/s.)

**Characteristics:—**

| | | |
|---|---|---|
| Heater Voltage | 6.3 | Volts |
| Heater Current | 0.25 | Amperes |
| Plate Voltage | 250 | Max. Volts |
| Plate Current | 15 | Ma. |
| Plate Dissipation | 2.5 | Watts |
| DC Grid Voltage | —3.3 | Volts |
| DC Grid Current | 7.5 | Ma. |
| Maximum Resistance in Grid | 0.5 | Megohm |
| Transconductance | 2900 | Micromhos |
| Plate Resistance | 11500 | Ohms |




**Interelectrode Capacitances:—**

| | | |
|---|---|---|
| Cathode to Grid | 1.3 | Mmfd. |
| Grid to Plate | 1.3 | Mmfd. |
| Plate to Cathode | 0.13 | Mmfd. |

## RL16 SINGLE ENDED U.H.F. TRIODE

(Full Ratings to 400 Mc/s.)

**Characteristics:—**

| | | |
|---|---|---|
| Heater Voltage | 6.3 | Volts |
| Heater Current | 0.43 | Amperes |
| Plate Voltage | 250 | Max. Volts |
| Plate Current | 10 | Ma. |
| Plate Dissipation | 7.5 | Watts |
| DC Grid Voltage | —2.6 | Volts |
| Transconductance | 6500 | Micromhos |
| Amplification Factor | 60 | |
| Plate Resistance | 9500 | Omhs |
| Equiv. Noise Resistance | 310 | Omhs |

**Interelectrode Capacitances:—**

| | | |
|---|---|---|
| Cathode to Grid | 5.2 | Mmfd. |
| Grid to Plate | 3.1 | Mmfd. |
| Plate to Cathode | 1.3 | Mmfd. |

## RL7—SINGLE ENDED R.F. PENTODE

(Useable up to 250 Mc/s.)

**Characteristics:—**

| | | |
|---|---|---|
| Heater Voltage | 6.3 | Volts |
| Heater Current | 0.3 | Amperes |
| Plate Voltage | 300 | Max. Volts |
| Plate Dissipation | 3 | Max. Watts |
| Screen Voltage | 300 | Max. Volts |
| Screen Dissipation | 1.7 | Max. Watts |
| Grid Voltage | 1.3 | Volts |
| Grid Resistor | 3 | Max. Meg. |
| Total Cathode Current | 15 | Max. Ma. |

**Interelectrode Capacitances:—**

| | | |
|---|---|---|
| Grid to Screen | 2.2 | Mmfd. |
| Grid to Plate | 0.02 | Mmfd. |
| Input | 6.2 | Mmfd. |
| Output | 4.9 | Mmfd. |

**Typical Operating Conditions:—**

| | | |
|---|---|---|
| Plate Voltage | 250 | Volts |
| Screen Voltage | 250 | Volts |
| Grid Voltage | 1.7 | Volts |
| Plate Current | 10 | Ma. |
| Screen Current | 1.45 | Ma. |
| Transconductance | 7700 | Micromhos |
| Grid Resistor | 0.5 | Meg. |
| Cathode Resistor | 150 | Ohms |
| Equivalent Noise Resistance | 700 | Ohms |
| Input Resistance (50 C/s.) | 10000 | Ohms |

Socket is 9 Pin Loktal. Base Connections as under:—

| | |
|---|---|
| 1—Heater | 5—Cathode |
| 2—Plate | 6—Control Grid |
| 3—Screen | 7—Cathode |
| 4—Suppressor and Cathode | 8—Cathode |
| | 9—Heater |

A shield should be fitted across the underside of the Socket running through the line of pins 4 and 8.

## CV66-RL37—GROUNDED GRID TRIODE

At frequencies of 200-250 Mc/s. this Valve gives about 5-6 DB improvement in signal/noise ratio over the RL7. A combination of an RL37 and an RL7 gives a gain of 16 DB and is a very satisfactory combination.

**Characteristics:—**

| | | |
|---|---|---|
| Heater Voltage | 6.3 | Volts |
| Heater Current | 0.3 | Amperes |
| Plate Voltage | 200 | Max. Volts |
| Plate Current | 10 | Ma. |
| Grid Bias | —2 | Volts |
| Transconductance | 8000 | Micromhos |
| Amplification Factor | 60 | |

**Interelectrode Capacitances:—**

(Grid Grounded, Heater connected to Cathode)

| | | |
|---|---|---|
| Plate to Ground | 4.0 | Mmfd. |
| Cathode to Ground | 5.0 | Mmfd. |
| Plate to Cathode, not more than | 0.1 | Mmfd. |

Socket is 9 Pin Loktal. Base Connections as under:—

| | |
|---|---|
| 1—Heater | 6—Grid |
| 2—Grid | 7—Grid |
| 3—Grid | 8—Cathode |
| 4—Plate | 9—Heater |
| 5—Plate | |

A shield should be fitted across the underside of the Socket running through the line of pins 3 and 7.

## TYPE EF50

Owing to lack of space, information and characteristics regarding type EF50 has been held over till the December issue of "Amateur Radio." However the base connections for the EF50 are given below. Socket is a 9 Pin Loktal.

| | |
|---|---|
| 1—Heater | 6—Cathode |
| 2—Screen | 7—Grid |
| 3—Plate | 8—Shield |
| 4—Suppressor | 9—Heater |
| 5—Shield | |

Some details of this Tube were given on page 4 of the January 1946 issue of this magazine.

## VCR139A—CATHODE RAY TUBE

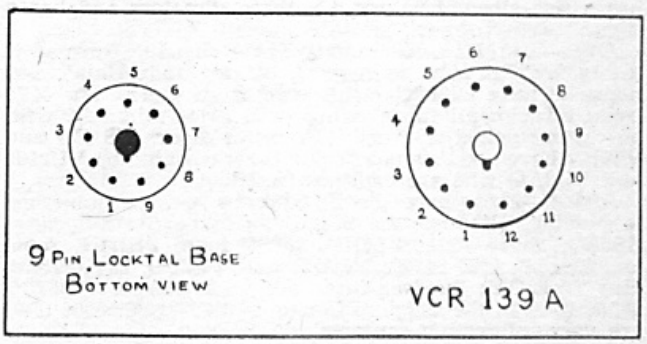
**Characteristics:—**

| | | |
|---|---|---|
| Heater Voltage | 4.0 | Volts |
| Heater Current | 1.1 | Amperes |

Focus and Deflection—Electrostatic.
Maximum Voltage, Anode No. 3—1000 Volts.
Sensitivity m/m/V/V—X—170.
Y—170.
Maximum Dimensions, diameter 70 m/m.
length 205 m/m.
Screen—Green.

**Socket Connections:—**

| | |
|---|---|
| 1—Cathode | 7—Deflection Plate Y2 |
| 2—Grid | 8—Deflection Plate X2 |
| 3—Heater | 9—Anode No. 3 |
| 4—Heater | 10—Deflection Plate X1 |
| 5—Anode No. 2 | 11—Deflection Plate Y1 |
| 6—No Pin | 12—No Pin. |




## *Can You Help?*

The Magazine Committee is contemplating alterations in the make-up of this Magazine. Have you any ideas in this regard? If so please drop a line to the Editor, c/o Box 2611W G.P.O. Melbourne, and let him know any improvements you would prefer.

# DX FOR THE MONTH

### 28-30 MEGACYCLES

The 28-30 Megacycle Band has really come to life with easy contacts on fone and CW to almost any part of the world, and WAC can be made in a few hours.

To my (VK3CP) knowledge, the band has never been better and it is a real pleasure for the low power man, with that most essential, the three element rotary beam.

This month the Europeans have been coming through from 5.30 p.m. until after midnight, and of the dozens of G contacts G8QX, situated on the East side of the Malvern Hills with an ideal location for VK, has been the most consistant contact although he is using only the humble folded dipole for an antenna. There have been many instances of contacts the long way round, as proved by a beam test to the short path with zero signals. The South American HC1FG on 28400 fone and Central American VP6YB at Barbados 28140 fone have had the test signals via Europe.

From the States there is usually a solid block of signals around 28500 but apart from this jumble the most interesting contacts with W stations have been from portable and portable mobile marine stations. W6LMK contacted here at 2 p.m. with R8 fone was a surprise for his little rig had a 37 osc. 14 Mc/s. xtal, 6L6 final with a 6A6 for the modulator with 15 watts input. The antenna being a vertical ¼ wave rod mounted on the back bumper of his car.

W5IFM on a Tanker 75 miles East of the KA Islands with only 9 watts input to a final 807, 6L6 tri-tet 7 Mc/s. xtal, 6AG7 buffer-doubler, modulator 6J7 from a carbon microphone to a 6L6 modulator tube and a folded dipole antenna 70 feet above the water line, is an excellent contact around 6 p.m. any day.

W9FQE, on an Army Transport heading for California, and at present in the South China Sea, is using 20 watts input to an 807 final to a folded dipole antenna.

W3KIF in African waters on the "SS White Falcon" near Kenya Colony is also an interesting contact.

**Europe.**—Observations here indicate that if the BBC programme on 26.1 Mc/s. is coming through, the band is wide open for the Europeans. Apart from the numerous stations from the Old Country, the following Europeans have been contacted: OK1WF, 28030 CW; PA0JQ, CW 28100 ex-PA4DA; LA1F, 28560 fone; SM5QV, 28060 CW; SM3ZF, 28075 CW; F8GR, 28300 CW; G4AJ, 28430 fone has a five element rotary, i.e. three directors and has a signal worthy of such an antenna.

**Asia.**—The Ham community at Rangoon, Burma, is losing XZ2RK who is moving off for Indo-China and hopes to have FI8RK on his card from there. The XZs come through all the evening until after midnight with our beams poked up North. From Singapore VS1BG and VS1BV have good signals. India is represented by VU2LR and VU2AQ who are consistent contacts.

**Africa.**—From here the ZS stations are too numerous to mention although the best seem to be the following: ZS6EQ, 28400 fone; ZS6FU, 28380 fone; ZS1AX, fone, and ZS2AL, CW 28100; VQ2FR and VQ2PL, 28110 fone; also VQ3TOM; the last three are in Rhodesia. OQ5BH, 28300 fone, in the Belgium Congo, and CN8LR, 28080 CW, are very interesting contacts.

**Central America and West Indies.**—VP6YB, 28140 fone; TG9JW, TG9JK, XE1KE, XE1FE fone and HR1MB, the later with our beams turned due East has a terrific signal around midday.

**South America.**—These fellows keep us guessing because you can never tell what part of this Continent will show up. Some mornings between 8 and 9 a.m. the 28-28.5 Mc/s. portion is packed full of LU stations although they seem to only work W8s. The following are consistant: VP8LK, 28020 CW, gives his QTH as Port Stanley Faulkland Islands, but the other VP8s say he is phoney although our beam must be due South; CE1AH, 28240 fone; PY2QK, 28400 fone, has just discovered he must put his beam due South for VK and beam over the Pole; HC1FG, 28420 fone, long way round at 7 p.m. EST; PY3AH, 28400 fone; LU2AJ, LU4AW, LU1DH, and LU3BQ all on fone with good English. PZ1RM in Surinan just North of Brazil is a new contact.

Noel, VK5NR, comes to light with a very helpful letter and the DX worked by him during the month consists of ON4NC, 28100 CW; PA0QJ, 28400 fone; F8OB, I1ON, LX1SI, new country; OK1JB, OZ3FL, UA1AA 28190, SM5UN 28050, YR5X 28025 CW, LX1AI, fone 28100. Come on boys and follow VK5NR's example and post that dope to either VK3YP or VK3CP.

South Australia report hearing the following stations on 28 Mc/s.: XZ2YT, J2EUG, J9AAK, VU2PK, VS1BG, TG9RC, GW2WD, G2ZB, PK1AM, G5TP, G6VX, LX1IS, SU1HF, PA0OO, KH6AB, KH6AM, G2WW, G2CDI, VU2LR, VU2WJ.

In New South Wales, judging by the following list of countries heard, there is no dearth of DX. 28 and 14 Mc/s. bands are very much on the improve, now that the summer season approaches, Europeans are coming through consistently each night on 28 Mc/s. and are reliable QSOs on both fone and CW. Countries heard regularly on 28 Mc/s. are as follows: Morning—W, VE, TG, XE, VP9, HR, VR, LU, CE, ZL, KZ5 mainly; Evening—K6, J, VU, PK, VR, OA, VS9, XZ, ZS, CR7, ZE, VK6; Night—K6, J, PK, VS1, G, GM, EI, I, F8, D4, OK, OZ, PA, SM, LA, UA, YR, GW, ON being mostly heard.

28 Mc/s. peaks for Europe at 9 p.m. then fades out and reopens from 10.30 to midnight.

### 14 MEGACYCLES

The list of signals heard in VK5 on this band indicates that South Australia are not exactly out in the cold. Signals heard include J2EUG, KA1KA, XE1BA, GI6TK,

G8WL, DN4TA, ON4AU, VS1BX, G4KE, OZ5HG, XU1YY, UA3AM, KZ5AA, F8YZ, J9LG, HC1FC, TI2OA, HB9AW, J9ACS, J4AAB, HB9CD, LU7EO, LU6DJK, LU7EN, HC1FG, SM7YE, OZ5HG, PA0HG, GW3ZU, PK6TC, J3HRP, CM2BA, PY2AL, YO5WZ, VP4TR, D4AND, KL7BH, HC1FG, D4AMI, XE1CQ, OZ7CC.

South Australia reports signals on 14 Mc/s. from VK6 have been audible last month at R9 plus, VK6DD, VK6KW and VK6HS being the pick. VK2 signals on this band also are R9 plus during the afternoons. VK2CP, VK2ABD, VK2AGU, and VK2AID standing out. VK4KH, VK4EF, VK4AV, VK4KO, VK4MW are the pick of the VK4 Hams. VK3 and VK7 are not so consistent, being mostly heard on Sunday mornings. VK3ZJ, VK3VJ, VK3BH, VK3XJ, VK3VB and VK7AB are all R9 plus.

The influx of South Americans into the 14 Mc/s. band has made WAC appear quite simple. VK5JS contacted eleven of these stations in less than a week. He was WAC on three successive nights in times ranging from two to three hours duration, although one night he could not raise a contact in Oceania for WAC and after vainly waiting for an Australian contact, secured PK6PC in Dutch New Guinea to secure his "Worked All Continents" in two and a quarter hours.

New South Wales report that 14 Mc/s. is still a mass of QRM but with patience plenty of DX about. Main 14 Mc/s. DX coming through is W, VE, XE, LU, CX, VP4, PY, OA, KZ5, K7, K6 (JO Marshalls), J, PK, VS1, VS9, XU, KA, PK6, ZS, VQ2, ZE, TA, YR, G, GM, F8, ON, OZ, LA, YR, D, UA, OK.

## FIFTY AND UP.

Ken McTaggart (VK3NW) again provides us with the doings on 50-54 Mc/s. in Victoria. Active on the band were VK3s ABA, YS, QO, MJ, HK, YJ, NU, ZD, LS, BW, ABU, GG, XA, and NW. 3NU is using two 807s in a push-push doubler and gets out very well with two half waves. 3ABU (portable 3BU of Geelong) was using 10 watts to an 807 doubler driven by an ECO oscillator on 12 Mc/s. a two tube super regen Receiver with 955 and 6V6 and a 8JK antenna with ¾ wave feeders. When worked he was 4 or 5 miles South West of Geelong at a "Lookout." We hope to hear more of Bill who has been threatening to break into 50 Mc/s. for some time. Unfortunately his home location is not too favorable, but if he keeps up the portable work it will be most interesting.

Sunday, 29th September, was quite a field day. 3ANW took the portable outfit, which was drawing only 1.7 watts on this occasion, to Olinda and after some tests in the morning, the afternoon was spent on the ridge between Olinda and Mt. Dandenong, 23 miles from Melbourne which is about 1500 feet high. Ten stations were contacted from 3ANW, viz.: 3NU, 3MJ, 3HK, 3YJ, 3QO, 3GG, 3LS, 3ABA, 3BW, 3ABU and everyone was surprised at the signal strength at each end. 3MJ and 3HK were getting the portable's signal at anything up to 10 DB over R9, while most other stations reported R9 to R9 plus. 3BW gave R7 and 3ABU R5. Similarly the incoming signals were extremely strong and 3ABU, from approximately 70 miles, was the weakest at R6/7. 3GG and 3MJ both contacted 3ABU. The portable outings have stimulated interest in the band and also in portable work itself. Several of the boys are contemplating portable work, the foremost being Dave (3MJ) who has just acquired an 815 which should put up a good show in this capacity.

The morning tests from Olinda conducted with the co-operation of 3MJ and 3HK were designed to determine "how much hill" it takes to stop a 50 Mc/s. signal

but were not entirely successful because there turned out to be not enough "hill" to give a very pronounced effect. Signals from 3MJ and 3GG were Q5 R6 at the Olinda Post Office, this being about 200 feet below the ridge and about ¼ mile down. 3GG reported the signal from the portable as R6 also. 3HK's signal was R8 but was apparently coming up the valley from Mitcham and not over the hill. However results showed that the signals do definitely "bend" to quite an extent and further tests are being planned in a locality where a more pronounced falling off can be obtained. Results of these tests are explained in another article in this issue.

The prediction charts continue to show the M.U.F. approximately 50 Mc/s. and VK2NO reports hearing unidentified stations in the region of 48 Mc/s. No such signals have been reported in Melbourne but it is felt that something will be doing shortly. One of the difficulties is the great lack of stations to watch the band at the most suitable times. However 3HK and 2NO are going to keep a watch at lunch times and new test transmissions are planned for the week-ends.

3ABA was heard on phone on the 12th October so apparently Jim has passed the six months' key pushing period. 3BD in South Yarra, was worked by 3MJ and myself cross-band 7—50 Mc/s., Eric being on 50 Mc/s. with a doubling 807. His sig was R9 plus with an indoor antenna. Eric is in the last stages of receiver building and will be fully operative on 50 Mc/s. shortly. He is one of the pre-war 56 Mc/s. boys from Sydney.

3NW now has the 166 Mc/s. outfit functioning and looking for contacts. The Receiver is 955 super regen. into 6J5 and 6V6 output. The Transmitter is a 955 linear oscillator with 1 inch copper tubing driving an 832 P.A. and modulated by a 6A6 Class B. The input is 18-20 watts and the antenna is a co-axial dipole. Would somebody oblige with a contact or two? The phone number there is Hawthorn 930 (VK3NW).



# QSL BUREAUX.

## FEDERAL AND VICTORIAN

**Ray Jones, VK3RJ, QSL Manager**

The list of names, addresses and call signs of Australian Experimental Stations has now been published. It contains particulars of all licencees up to 31st July, 1946. It is well printed and at the price charged (2/-), it should be a necessary adjunct to all stations. The list is obtainable from the Wireless Branch of the P.M.G. Department.

F.H.Q. is now in a position to make recommendations for WAC. Cards should be submitted to the Federal QSL Manager, who will certify to F.H.Q. and return the cards. F.H.Q. will then make the necessary recommendation to the I.A.R.U. The R.S.G.B. has temporarily suspended the granting of WBE and BERTA certificates.

The box number of the S.A.R.R.L. has now been changed. The full QRA now is: S.A.R.R.L. QSL Bureau, Box 3037, Capetown.

Cards are coming to hand from AC4YN whose mailing QRA is R. Fox, Gyantse PO Tibet, via Calcutta.

A card and letter is to hand from W8CHT portable J7, Hokkaido, Japan. He has omitted to put a callsign on the card or on the letter. The letter begins Dear Sheila and Dick and relates to a phone QSO at 1910 TST 7th September, 1946. The owner can have the letter and card on application to this Bureau.

An incompletely filled in card is also to hand from G6CU/ZC2 of the Cocos Islands. It refers to a QSO on 15th February and the call sign given is VK3W. The card may be had on application.

A further one for the philatelists: Vaclav Bernat, OKRP 1273, Kutna Hora Bohemia, U Jelena 487, Czechoslovakia.

The Federal QSL Manager will be on vacation for the first three weeks in November. Distribution of cards at the November VK3 meeting will be arranged as usual but some lag in Interstate despatches is inevitable.

C.A.V., the official society for Czechoslovakia, is again in full swing the secretary being OK2RR Otakar Halas, Post Box 34, Bratislava 9, Czechoslovakia.

A note to hand from that ubiquitous fellow "Snow" Campbell (VK3MR) shows that he has finally shaken down in the married state at Quambatook, Victoria. He passed on a photo of Jack Decure, ex VK3WL, secured while in VK5. The "demon" looks to be in the pink and is surrounded by an extra fine array of progeny. "Snow" also wishes to acknowledge an "Asmusgram" from one Herman VK3ET. VK3MR will be on when the power situation is solved.

John A. Hunt (VS4JH/G2FSR) passes along a bunch of cards and bemoans that he did not receive cards—as yet—from the following VK's 3BW, VU, YP, VJ, JA, VQ, SE, TM, ZU, VD, BC, UJ, YT, ZR, GD, MR, UQ, JE, WX and ABA. All these related to 28 Mc/s. QSOs some months ago, and he requests me publish a reminder to the stations concerned. In conclusion he writes "I should like to extend my very sincere regards to all the VK boys whom I contacted and to thank them for many pleasant hours on the air from Borneo. Quite truthfully the outside Ham world could not do better than follow the example of the average VK with regard to operating, helpful advice and the all too elusive Ham spirit" (this does not refer to Ballarat Bitter). John now on the way home to England will always be an ambassador for VK and requests that all who have not QSLed him do so to his home QRA: Mr. J. A. Hunt, 2 Parkhill Road, Chingford, London, E.4, England.

Ivor Stafford (VK3XB) and his good wife Mavis (VK3KS) are located at Mt. Best, via Foster, Vic., and cards attest they are doing OK from that location despite Ivor's assertion that he spends most of his time re-erecting masts and reguying, etc., due to the prevalence of strong winds in that locality. A gale a day says Ivor.

Another one who is just out of the Services and took unto himself a wife during his sojourn with the R.A.A.F.

(Continued on Page 27).

# *FEDERAL HEADQUARTERS*

## RESUME OF ACTIVITIES

Here are some brief details of the activities of F.H.Q. over the last few months. Federal Executive has been very busy handling a large number of matters since the Convention in April. This has resulted in a great deal of credit to the W.I.A., for which we are grateful, and yet we still have a long way to go before we have completed the job we set out to do.

We have maintained a very cordial relationship with the P.M.G. Department and we have so far been successful in obtaining a number of changes and improvements in the regulations concerning Amateur Radio. We are still negotiating with the Department for further advantages for the Ham, specially in regard to frequencies, types of emission, class of licence, etc.

## QSL BUREAU

You have, no doubt, observed from recent issues of "Amateur Radio" that the QSL Bureau has been well established and is functioning under a pretty heavy load.

## DX CONTEST

F.H.Q. had very little time at its disposal to arrange the DX Contest for November, but the Contest appears to be assured of success judging by the favorable reception it has had. It is most unfortunate that we were unable to have a joint VK-ZL this year, but we hope to have the ZLs with us next year.

## CONSTITUTION

F.H.Q. has prepared a draft of a new constitution as requested at the Easter Convention. This has involved considerable discussion of many aspects and represents many hours of application. We hope the Divisions will give it as much thought when they discuss it soon.

## P.M.G. DEPARTMENT

We have had many communications with the Chief Inspector's Branch concerning many of the regulations and we have received a good hearing regarding some modifications, and privileges of these regulations. We have asked for:—

1. A reversion to one class of licence.
2. Restoration of the whole pre-war HF bands.
3. Allocation of higher frequencies (in the 200 to 22000 Mc/s. region).
4. Licencing of types of emission A0-A5 in addition to FM and Pulse on various bands.
5. The modification of regulations with respect to mobile and portable operation, high power components, age limit for licences, relaying of amateur transmissions or constant tones, and other similar details.

## VARIATION OF CONDITIONS GOVERNING THE OPERATION OF EXPERIMENTAL WIRELESS STATIONS

The following is taken from an official communication from the Radio Inspectors' Department and is an enlargement of the Stop Press items in last month's magazine.

The following variations, which take effect as from 25th October, 1946, affecting the conditions governing the licensing and operation of Experimental Wireless Stations are forwarded for the information of members of your Institute and experimenters generally.

### Experimental Advisory Committee

Representation on this Committee will be on a pro rata basis between representatives of the Wireless Institute of Australia and non-members of that Institute, with a minimum of one non-member. A member of the Wireless Institute may be appointed to fill the vacancy caused by there being no non-member offering. In the event, however, of a non-member subsequently becoming available, he should receive consideration for appointment at the conclusion of the normal twelve months' term of the existing Committee.

### V.H.F. Frequency Allocations

The following additional frequency bands are now available for the use of Experimental Wireless Stations:—

2500—2700 Mc/s.
5250—5650 Mc/s.
10000—10500 Mc/s.

### Types of Emission

Subject to the requirements regarding identification and time limitations, type A0 waves may be used on all experimental frequency bands from 166 Mc/s. upwards. Their use on lower frequency bands will not be permitted without the special authorisation of the Chief Inspector (Wireless).

NOTE.—Type A0 waves are those in which the successive oscillations are identical as soon as a steady state is reached (continuous waves). A type A1 wave is a keyed continuous wave.

### Portable and Mobile Facilities

On all experimental frequency bands from 50 Mc/s. upwards, experimental licencees may operate portable and/or mobile stations without the necessity of obtaining a permit. This privilege will not affect licences already granted or which may be granted solely for portable operation on all experimental frequency bands, or the present arrangement whereby limited portable or mobile operation is permitted on any experimental frequency band at the discretion of the Superintendent in the State concerned.

Except in the case of stations licenced for portable operation (for which they are allotted distinctive call signs), the words "portable" or "mobile" respectively, and the locality of operation must be announced with each transmission conducted by a portable or mobile station. The necessity for obtaining the sanction of the Chief Inspector (Wireless) to conduct transmissions beyond the boundary of a State for which the station is licenced will not apply in respect of portable or mobile stations operating on frequency bands from 50 Mc/s. upwards.

### Transmissions of Recordings

The restriction on the transmission of recorded music, imposed by Rule 25 of the "Handbook for the Guidance of Operators of Experimental Wireless Stations" is not intended to apply to the use of single constant tones, or similar sounds recorded by means of a sound recording device used solely for tests and having no entertainment value. Consequently, such transmissions may be permitted.

### Relaying of Experimental Transmissions

On the experimental frequency bands from 50 Mc/s. upwards, the restriction on the relaying of experimental transmissions, referred to in Rule 25 of the "Handbook for the Guidance of Operators of Experimental Wireless Stations" is lifted. The relaying station must, however, identify itself in accordance with Rules 96 and 97 and conform in all other respects with Departmental requirements.

The granting of this privilege does not in any way authorise experimental licencees to re-transmit signals emanating from any station other than an experimental station.

F.H.Q. considers good progress is being made and will continue negotiations with the P.M.G. Department with a view to having the other modifications adopted.

### BADGES AND MEMBERS CERTIFICATES

Production of badges and members' certificates has been delayed by circumstances beyond our control. Apparently present day difficulties and shortages are holding up deliveries.

# *DIVISIONAL NOTES*

## NEW SOUTH WALES

**Secretary: Peter H. Adams, VK2JX, Box 1734 G.P.O. Sydney.**

**Meeting Place: Science House, Gloucester and Essex Streets.**

**Meeting Night: Fourth Friday of each month.**

The September general meeting held at Science House on the 27th was attended by more than 100 members and judging by the number of enrolments for the month, some 30 odd, even bigger attendances are anticipated.

Those present including visitors VK6RB and VK3ARG, heard a particularly interesting lecture supported by a film and slides on the Cathode Ray Oscillograph delivered by Mr. John Moyle (VK2JU). John's talk could not have been given at a more appropriate time in view of the anticipated availability of a number of cathode ray tubes at more than reasonable prices.

Once again, time for general business and discussion was at a premium and consequently, it was decided that the October meeting be devoted entirely to discussion of matters of major importance in so far as our operations as amateurs and members of the Institute are concerned. Some lively discourse of benefit to all is anticipated. In view of the foregoing and the non-receipt of certain items of the Disposals equipment, a special meeting is to be held as soon as practicable for distribution. No doubt many members are disappointed at the apparent lengthy delay in finalising this matter of vital interest to us all but rest assured that everything possible has been done to overcome our difficulties. Unfortunately, transport is just one of the factors over which we have no control.

In pursuance of our policy to strive for an improvement in the benefits accruing country members, VK2OJ, Noel Arnold, has been appointed Zone Officer for the Albury district. Noel will be remembered to many as one of our most capable Zone Officers in those now famous pre-war days. It is further hoped to arrange one of our equally famous W.I.A. Field Days at Wyong in the immediate future.

The Division's second A.O.C.P. Class concluded on 2nd October with 16 members attending the P.M.G's. examination. Although final results are not yet to hand, the Class Manager, Mr. Jack Howes (VK2ABS), is confident that both amateur and Institute ranks will be considerably swelled in consequence. To the uninitiated, may we draw attention to the high degree of organising ability, technical knowledge and patience required of a capable instructor, all of which qualities are possessed by Jack and his assistants.

The Bushfires Communications Network is gaining increased support from country members with sections being established in all corners of the State. The Army type 109 set adopted as the standard "truck-set" for this type of work, with necessary modifications incorporated has proved entirely satisfactory in tests carried out to date. Some of our Shire Councils are rather slow to appreciate the value of adequate communications in combating the bushfire menace, but thanks to the ability of the "Ham," this viewpoint is rapidly moving through 180 degrees.

The regular VK2WI 7 Mc/s. Sunday morning broadcasts have continued. The extent to which these broadcasts are received has been demonstrated by the many enquiries made concerning frequencies, times of transmission and reception conditions. It is hoped to have a special frequency allocated for the 2WI transmissions in the immediate future—in the meantime, however, all members irrespective of State are asked to co-operate by keeping VK2WI's channel clear each Sunday morning from 1100 to 1115 a.m. A new feature of the broadcast of interest to many is the inclusion of the weekly and special ionospheric predictions with a summary of actual conditions for the previous week.

During the past month, two N.S.W. Division Councillors (VK2XX and VK2VN) had the opportunity of visiting our neighbours in VK3 and discussing matters of mutual interest with State and Federal authorities. It seems a pity that visits of this nature cannot be made more frequently as once again, the principle that in five minutes discussion as much can be accomplished as in 5 days exchange of correspondence, was demonstrated.

By the time these notes appear in print, the first post-war Australian DX contest will be in progress. Good luck to all and may the best man win—let us strive for a high standard of operating ability, co-operation and spirit which has materially contributed to the high esteem in which the VKs were held throughout the world in the days gone by.

A valuable reward awaits the first member correctly identifying the author of the personal doings which follow! In November, Charlie Luckman (2JT), well-known to all old timers particularly in N.S.W., completes 25 years as the holder of a Ham licence. Charlie has not only "held" the licence but has been very active over the whole of the period. It was with great pleasure that we all heard his call on 28 Mc/s. early this year, but at the moment 14 Mc/s. CW is favourite with European DX coming back to his CQs. Hope you are on to celebrate the 50 years Chas. Another old timer call 2RF is heard these days so it appears that they are all "starting over again." Ex-2NR, 2AJX these days, is on 14 Mc/s. now

but very few recognise an old DX Contest King under the call of 2AJX. The way he rolls the DX over "should tell 'em." 2NS (Trevor Evans of Bathurst) started up once again too using the home clothes line as a start, but now the old transmitter just with the dust knocked off has a proper skywire and 2NS can once again be heard yarning to all the old gang as in days when VK2 stations were pretty rare.

There seems to be an epidemic to get rid of three letter calls in VK2, probably the first was 2AFB who dropped the "A" and became the shorter 2FB, then 2AHP changed to the call of a very old timer "Nick" 2HK; 2AEC became 2TR who went to VK7; and the latest seems to be 2AKX whose call is now 2HI. Poor old QSL Officer if it spreads—so please no two letter call chappie die off and leave them a vacancy, hi! Roy Hart (2HO) reckons its pretty impossible to get out of "Art Ollow" his QRA so he has erected a 56 feet tower surmounted by a three element beam for 28 Mc/s., on 14, 7 and 3.5 Mc/s. he uses a Jones type S.W.F.

2NI slowly turning grey like many another Ham owing to QRM from trams and cars. However, still has enough vim to experiment with Cathode Followers in modulators in a Cathode Modulated Final. 2ARM (ex-4RM) is active on 14 Mc/s. with 100 watts to a TR1/100, and judging from the pile of QSLs he turns in at each meeting results are very satisfactory indeed. 2AH's 211Es used as grid controlled rectifiers and keyed by relay. Keep grids very positive and return to negative HT instead of open circuit grid for cut off. Current can be 100 Ma. at as high as 1500 volts. Regulation not very good owing to thermionic voltage drop. His other suggestion is for beam rotation. The steering box of a small car can be used as a right angled drive, reduction gear and support for your beam. Price approximately 25/- at wreckers' yards.

2ATH has been receiving a visit from 3ARG who worked a couple of ZLs on 3.5 Mc/s. with an input of 8 watts. He reckons 2ATH's receiver and transmitter must be pretty efficient considering QRN from Auroras, Sunspots, etc. 2BG has recently moved from a nice location at Eastwood to a ground floor flat at Kirribilli. He is not overjoyed (from a Ham's point of view) with the change, and the rig now has to sit on the kitchen cupboard, but he hopes to be fairly active. In spite of what you may have heard to the contrary 2GM is now inactive, owing to QRM from a house recently drawn in a Housing Commission ballot. 2ALG is very busy working all the country chaps on 7 Mc/s., great rebuilding going on for 3.5 and 50 Mc/s. As regards 50 Mc/s., Don (2NO) who used automatic CW around 1 p.m. on Sundays, was recently heard by 2OC at Wyong. Don's was the only sig Owen could read though others tried to get through. It's all in the antenna sez Don.

**Coalfields Zone**

2DG operating mainly on 14 Mc/s. and doing well with 55 countries post war. 2TY, Bob, heard regularly on 28 Mc/s. and getting his share of DX; at present enjoying a trip to VK4. 2MK and 2LB inactive, doing a spot of building. 2YO not heard much, though does work on 7 Mc/s. 2PZ operates 7 and 14 Mc/s. occasionally. Chris has lots of gear, but busy with service work and not much time for Ham Radio at present. 2KZ, Max, is one of our regular Coalfields gang, and operating 28 Mc/s. only with fairly good results, contemplates building a super room which will be a big help at 2KZ. Has a lad as keen as the OM. So in years to come we may have another brass pounder. 2XT is not active, but building a shack in readiness to open up.

2ADT, Jack, still doing a good job on 28 Mc/s. Getting really good results with a three element rotary and DX now stands at 40 countries and all on 28 Mc/s., all but one or two worked on fone including W.A.C. Some of his DX (what I can think of!) VK, PK1, VK7, ZL, KG6, VR2, K6, KL7, VE, W, XE, HR, TG, LU, CE, HC, J, XU, VS1, VS9, XZ, Okinawa, Marshalls, Marianas, VS7, ZS, SU, G, D, F8, SM, KA, KW6, PA, VQ2. Jack is putting up antenna for 14 Mc/s. and hopes to be in contest, works 14, 7, and 3.5 Mc/s.

2YL, operating with good results on 28 and 14 Mc/s., also working 7 and 3.5 Mc/s. Hopes to operate in contest. DX here now up to 47 countries and W.A.C. post war. The three element rotary on 28 Mc/s. doing swell job. 8JK on 14 Mc/s. getting out well, rebuilt part of receiver and working fine now, DX as follows: VK, UK7, VK9, PK1, 3 and 6, ZL, Tinian, VR2, Saipan, KA, J, XU, VS6, CR9, CR7, ZS, VU, XZ, VS1, VS9, VS3, EQ3, VS5, KG6, J9, Marshalls, Okinawa, K6, KL7, VE, W, XE, KZ5, CM, TQ, LU, HC, G, F8, D, OZ, PA, LA, SM, UA, VS4, KE6 and ZC4.

## VICTORIA

**Secretary: R. A. C. Anderson, VK3WY,**
**Box 2611 W, G.P.O., Melbourne. WM 1579.**

**Meeting Night: First Tuesday of each month.**

The October general meeting was attended by 196 members and visitors and through the continued illness of our president (3KN), Herb Stevens occupied the chair. The visitors included VKs 4OA, 5EL, 6WT, 5RO, and 2VN, Jesse Smith (ex-XU3GG), AC8JS, and Mrs. Laurel Emmel (XYL of 3AJE). The following VK3s were present: PW, XJ, WQ, VX, OK, OT, AJH, XM, KP, RX, NM, ZB, FR, AME, UH, TZ, QP, HS, RN, GS, AHM, UJ, GU, FW, ADS, LL, QH, LM, AE, WO, IP, AJK, ADX, MQ, VZ, VH, AP, DK, HK, IG, PG, EX, EN, II, JF, FU, PU, ACM, ARN, VJ, ED, XA, AKL, OG, AGS, QI, OL, ABD, UO, FX, EV, EM, YR, PC, QS, QW, VQ, KV, ZJ, OF, VQ, NU, SO, XR, DF, TU, LN, WW, TF, OJ, JF, WF, AH, CF, JI, HC, UM, MJ, AG, YK, JD, YJ, QZ, JE, DZ, VD, JZ, JT, GX, MN, QU, LA, RI, IW, YS, ABA, ADF, ACS, KC, ZV, ES, AJY, OV, ZC, AJE, KM, PQ, TQ, MO, QE, HX, AI, also ex-2TJ, Messrs. Tew Crowther, Merritt, McLeod, Johnson, Belcher, A. G.

Smith, Sykes, Maroney, Wolstenholme, Gauntlett, Strickland, Holland, McClouskey, Knight, Pile, Taylor, Chalmers, Hodgkinson, Moon, Sandon, Rimmer, Cosgriff, Forshaw, Morrison, Billings, Lancaster, Henderson, Western, Barnes, Elliott, Neilson, Sullivan, Gray, Moran, Hibbert, Groves, Warner, Briggs, Amor, Russell, Houston, Gee-Wah, Gilbert, Gillingham, Meallin, Hodson, Iliffe, Titherudge, Sloss, Porter, Storck, A. Morrison, West, Curnow, Searle, Clarke, Jones, Fawkes, Hayes, Camp, Poppleton, Harbour, Benning.

In consequence of the amount of time spent in the distribution of QSL cards mentioned in last month's notes, the QSL Manager (Ray Jones, 3RJ) opened up his dispensing department a little after 7.30 p.m. The early arrivals at the meeting came to a mutual agreement that there was no claim jumping of pews whilst they queued up for their cards. With this system it appears that a new era QSL distribution is being launched in VK3.

The Secretary announced that a general distribution of materials purchased from disposals would be made available during the week of the meeting and judging by the tired look on his face it looks as though he has very little material left on hand for distribution. Your scribe stood amongst others for approximately one hour, which in these days queues are nothing unusual but very back-breaking after a day's work. The 1946-47 membership cards are now to hand and the Treasurer will be forwarding same in a short space of time to FINANCIAL members.

In the absence of the Federal Executive Councillor a progress report was given by a member of F.H.Q. of the negotiations with the P.M.G's. Department which mainly consist of items appearing in the stop-press notes in the October issue of this journal.

At the conclusion of general business 3UK gave a rather comprehensive lecture on "Radio Communications in the Services during war-time" for which he was very enthusiastically applauded by the assembly.

## "THE TECHNICAL ADVISORY COMMITTEE, IT'S AIMS AND OBJECTS"

Included in the Victorian Division Notes published in "Amateur Radio" of October, 1945, was a very informative article entitled, "The Laboratory Committee, Its Aims and Objects." In order to introduce the "Technical Advisory Committee" we crave the indulgence of members who have already read that article, while we quote extracts therefrom for the benefit of new members.

"The Victorian Division of the W.I.A. has always been proud of its claim to be the possessor of first-class laboratory equipment. The fact that it was seldom used, and no determined effort made to set it up in a laboratory kept up to date by the addition of new equipment as it became available, is a reflection on either the financial policy of the past or lack of interest in such a project, or both.

"Amateur Radio has progressed through the years, and the more or less haphazard cut and try methods of the past have now given way to practices involving the use of accurate measuring equipment of all kinds, much of which is too costly for the average Ham to purchase.

"One of the first objects of the Laboratory Committee, therefore, is to plan, design, construct and equip with modern and accurate apparatus, a laboratory which can be of assistance to members in their efforts to secure maximum efficiency from their gear, and to test the accuracy of the calibration of their own test equipment. The Committee, in its report to Council in July, 1944, recommended that the apparatus necessary to establish such a laboratory should include the following:—

1—Beat Frequency Oscillator, or other suitable type, having a range of from 20 to 15,000 cycles per second and capable of developing at least two volts across a suitable range of output impedances.

2—Precision Signal Generator, suitable for making accurate tests on communications and Ham band receivers.

3—Inductance, Capacity and Resistance Bridge.
4—Vacuum Tube Voltmeters.
5—Cathode Ray Oscilloscope.
6—Heterodyne Freqency Meter.
7—Transmitting and Receiving Tube Testers (Mutual Conductance).
Such measuring or other equipment as may be deemed necessary for future developments.

"With a laboratory so equipped, the Committee would be in a position, not only to apply many tests to members' own equipment, but also to carry out experiments and tests to determine the behaviour of new circuits, components and practices, and to write up their observations, and results of such experiments and tests in the form of technical articles for the Magazine.

"The provision of technical articles for 'Amateur Radio' is another important task for the Laboratory Committee, and one which will require continuous attention. By careful planning and selection of subjects, and co-ordinating the efforts of contributors, it should be possible to build up a reserve of articles of a standard that reflects the undoubted genius and ability of the Australian Radio Amateur. With the re-introduction of the printed magazine, this task has increased. If it can be arranged, we plan to include as regular features, in addition to the main technical articles, a Digest Section, a Beginners' Section, etc., as space permits."

These were the laudable aims and objects of the "Laboratory Committee" as it existed until Tuesday, 20th August, 1946, mainly due to the dogged persistence of Messrs. Stevens, Quinn and Ridgeway, supplemented by various members and ex-servicemen returning to the fold. In the evening of above day, members of the Laboratory Committee gathered at a special meeting to consider the future.

Firstly, it was recognised that the post war period would be saturated with new developments, due mainly to the release of war-time inventions for general use. Hence, the scope of the committee would have to be considerably increased in order to give adequate service to members.

Secondly, it was recognised that in order to properly function the committee would have to be properly constituted and have the wholehearted support of Council and members generally.

After a lengthy discussion the following proposals were submitted to the Council for consideration and approval:

(1) That Council formally constitute this Committee under the title "Technical Advisory Committee."

(2) That Council approve the appointment of the following Office-Bearers:—
Chairman of Committee: Mr. H. N. Stevens, VK3JO.
Vice-Chairman and Deputy Council Representative: Mr. C. Quinn, VK3WQ.
Hon. Secretary and Council Representative: Mr. G. Glover, VK3AG.
Assist. Secretary: Capt. W. Mitchell, VK3UM.

(3) Secretary's duties to include the preparation of monthly report of committee's activities which would be read before general meeting by each member of committee in rotation. This would give members generally an opportunity of becoming acquainted with members of committee and at the same time follow progress of programme.

(4) That Council appoint member of committee to represent the latter at Council meetings. It is considered that such close liasion between Council and committee will expedite the work of both by ensuring unification of control and avoidance of overlapping of functions.

(5) That the scope of committee's activities should be:
(a) To advise Council on Technical Matters.
(b) To provide Technical Advisory Service for Institute Members.
(c) To control groups doing specific research and development work.

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(d) To be responsible for the provision, construction, control, and maintenance of all technical equipment.
(e) To undertake the establishment of standards, where applicable to the work of the Institute.

(6) That future programme should be developed along the following lines, as time, personnel and facilities permit:—
(a) Establishment of Band Edge Location Transmissions (B.E.L.T.).
(b) Establishment of a Frequency Measuring Service (F.M.S.) for Institute Members.
(c) Provision of communications equipment, for use by Traffic Manager and to supplement (a) and (b).
(d) Establish Laboratory and Calibration Service for Institute Members.
(e) Modernise Technical, Book and Magazine, Reference and Lending Library.
(f) Modernise Technical Instrument Library, both for internal use and lending purposes.
(g) Draw up syllabus for A.O.C.P. Classes.
(h) Plan and supervise programme covering Technical Articles for the Magazine.
(j) Training young members in practical work.
(k) Preparation, programming, and presentation of lectures, demonstrations, etc.
(l) Such other duties as instructed by Council
(m) Provision and maintenance of Class Demonstration Equipment.

(7) That the following Groups be formed immediately and others added, and work further divided, as soon as personnel and facilities will allow:—
Group No. 1, Sub-Committees:—Advisory Panel, A.O.C.P. Class Syllabus, Lectures, etc., Technical Editorial Magazine, Correspondence Column in Magazine, Standards.
Group No. 2, Laboratory and Calibration:—Band Edge Location Transmissions, Frequency Measuring Service, Laboratory Measurements, Calibration of Members' Equipment.
Group No. 3, Library Service:—Text Books and Publications, Instruments.
Group No. 4, Transmission and Reception:—Transmitting and Receiving Equipment, Maintenance of Communications and Class Demonstration Equipment, Power Supplies, Modulation Technique, Portable and Emergency Equipment.
Group No. 5, Propagation:—Ionospheric Studies, Aerial and Earthing Systems.
Fields to which sub-division and extensions are contemplated include:—Modulation Technique, Portable and Emergency Equipment (such as Bush Fire Fighting Equipment), Visual Technique (Television, Facsimile, etc.), Micro-Wave Technique.

(8) That the following appointments be approved:—
H. N. STEVENS—Chairman of No. 1 Group.
DUNCAN GRAY—Leader No. 2 Group.
G. GLOVER—Construction of Band Edge Location Transmitter.
K. RIDGEWAY—Technical Editorial Magazine.
J. GROVES—Librarian (Book).
R. JEPSON—Librarian (Instrument).
D. MEDLEY—Leader of No. 5 Group.
E. FERGUSON—Maintenance of Communication Equipment.
W. MITCHELL—Provision and maintenance of Class Demonstration Equipment.
H. WEBBER—Portable and Emergency Equipment.

The Council in its wisdom accepted these proposals, recognising both the importance of committee's work and its need for greater assistance from everyone concerned in the future of Amateur Radio.

The organisation plan published herewith should enable members to appreciate the set up of the committee and its groups.

Having got down to brass tacks regarding its constitution, aims and objects, the committee is now seeking the assistance of each and every member of the Victorian Division, in order to ensure that the project is highly successful.

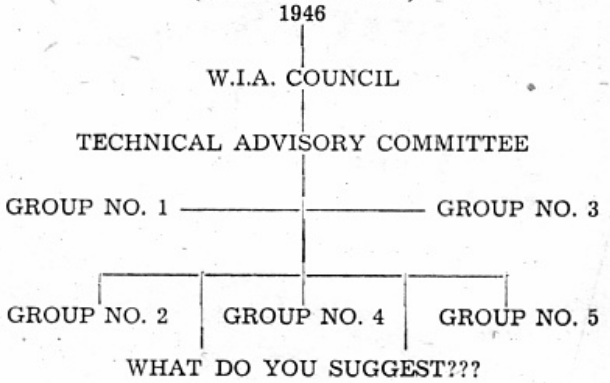
For the information of members generally it is desirable to stress that the committee is not only available to advise your Council on technical matters, but also to provide such advice as required by individual members.

In order to keep members who are unable to attend the general meeting fully informed regarding the activities of the Technical Advisory Committee, the report as read before the meeting will be published in "Amateur Radio" under the Victorian Notes. In addition to the report each month some section of the committee's activities will receive special attention.

The object of this report, as previously stated, is to keep you informed of the committee's activities, and a cordial invitation is extended to you to come and see, or better still stay and help the committee at work. There is plenty of scope for willing and interested members. Get in touch with the leader of the group in whose work you are interested—get cracking NOW!!

For further information ring Secretary George Glover at WX 3440.

**ORGANISATION PLAN FOR THE TECHNICAL ADVISORY COMMITTEE OF THE W.I.A.**
**(Victorian Division)**
**1946**




# QUEENSLAND

**Secretary: C. Marley, VK4CJ,**
**Box 638 J. G.P.O., Brisbane.**
**Meeting Place: State Service Building, Elizabeth St., City.**
**Meeting Night: First Friday of each month.**

The chief item of news for you fellows this month is that Frank Nolan, 4FN, has been made a member of Council and is our "Amateur Radio" representative. Our country members who, it seems have been a little disgruntled of late, will be pleased to learn that Frank Shannon, 4SN, is now looking after their interests. We can't think of a better man for the job, as an ex-country man should know what's wanted.

The practice of using high-powered bottles in medium powered rigs has been the cause of a few snarls between the Department and some of the local lads. According to a late flash just received, the position is now under control which means that by the time you read this, if you are a "B" class licencee, it's still OK to leave your 813 running with up to 50 watts input.

The majority of news this month will be devoted to country men, the reason being that there is more country news than local to work on. We see that our old "high-

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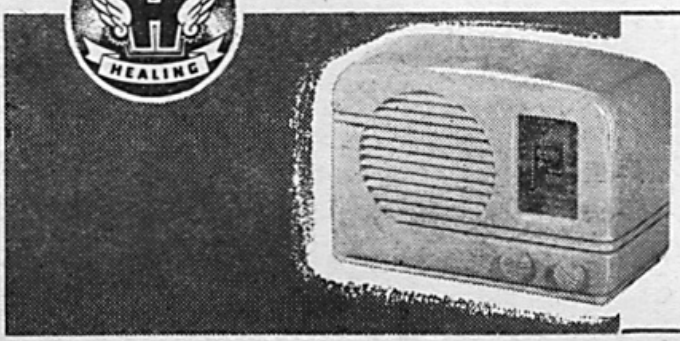

# Golden Voice RADIO

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power" friend, 4HZ, is still ill-treating his final with 2 watts input to a 19. Max is working plenty of ZL's with this outfit but is anxious to get hold of an FS6. 4LN already has an FS6 but is striking trouble loading any sort of antenna. Is having fun and games with a 2 element beam which so far refuses to "beam." 4SN, the voice of Tamborine, has a 2 stage rig going with 12 watts from a vibrator. Frank has plans for a Vee beam and fone. The leading chemist of Longreach, 4RQ, is striking the usual troubles one strikes with a badly regulated 240 volt DC supply. They have been chasing the dust off the rig at 4OK where 7 Mc/s. activity is reported, using the 1D4 in the Rx as modulator for the screen of the 6V6 PA. The antenna coupling arrangement is also a 4OK patent. Jack and George have two series condensers in the PA and the antenna feeder is coupled to the mid-point, providing, we are told, an effective method of tuning and antenna coupling. He thinks "A.R." needs overhauling to bring it into line with overseas publications (What are your suggestions—Editor).

We have pleasure in informing 4HK that we have spent considerable time in trying to get onto disposals gear for the Ham. The only suggestion we can make is to become a VK3. We here in Brisbane thought that 4HR was working more DX than most if not all VK4's. However we hear that 4DA, up in Dalby, has worked 54 in the last couple of weeks. Has an FB rig with 100 watts to an 813. Nice work Max! This week's high spot is the appearance of 4XG, late 4JN, on 54 Mc/s. Congratulations OM, and in more ways than one if you know what I mean! Then there is this "Believe it or not," 4FN, under the shadow of a local BC station, gets **110 Ma. in his antenna.** Frank says if it was his he would not mind! We take the opportunity of advising once again that Great Circle Maps are obtainable to members at the cost of 2/- each.

## SOUTH AUSTRALIA

**Secretary: E. A. Barbier, VK5MD,**
**Box 1234 K, G.P.O., Adelaide.**
**Meeting Place: 17 Waymouth Street, Adelaide.**
**Meeting Night: Second Tuesday of each month.**

The monthly general meeting of the W.I.A. was held at 17 Waymouth Street on Tuesday night. Among the visitors present were Messrs. M. H. Coltman, P. M. Williams, A. S. Dunnecliff, L. Rankine, E. Menkins, G. Warner, W. E. Wegner and I. S. Wall. Visiting hams included VK5CJ, VK5DC. Mr. Roy Buckerfield (VK5DA) delivered an interesting lecture on "Selective Amplifiers" and a vote of thanks to the lecturer by Mr. Jack Lester (VK5LR) was received with acclamation.

Mr. Buckerfield in his lecture on "Selective Amplifiers for Receivers" divided the subject into two sections. Firstly dealing with crystal filters, demonstrating the requirements with graphs and circuit diagrams. He explained how a crystal filter could be constructed to give variable selectivity enabling it to be used for phone signals whilst still retaining its selective properties for CW. "Buck" also described how this could be achieved using parts readily available in the Ham shack, and also the revamping of I.F. transformers and condensers for use in this circuit. Secondly dealing with selective audio amplifiers whereby with the use of positive feedback and a tuned circuit to resonate at approximately 1,500 C/s. placed in the grid circuit of the output tube in place of the usual grid resistor, switches being used to cut in the feedback, tuned circuit or grid resistor. A detailed explanation of this was given with circuits, graphs, curves, etc., and concluded with a practical demonstration using a two stage audio amplifier with positive feedback, tuned grid circuit, B.F.O. and a recording containing code signals of about 1,500 C/s., static, QRM and phone signals. This demonstration was the highlight of the evening.

The recording when played back through the amplifier minus feedback or tuned circuit was just a hash of QRM and the code signals were down in the mud and practically unreadable, but when the feedback and tuned grid network were switched in the effect was astounding to say the least. The 1,500 C/s. code was the only signal audible, the rest of the hash having disappeared entirely. Judging by the remarks passed and the intelligent questions asked it was apparent that the lecture and demonstration was probably the most successful of the year. It was generally agreed at "Smoko" that lectures of this type are "just what the doctor ordered" for ham gatherings.

The VK5 division is to hold a field day in the near future and a working committee has been formed consisting of Joe McAlister, Charlie Cheel (5CR), George Bruce (5GB) and "Tubby" Parsons (5PS). Arrangements are going ahead and the tentative picnic area will probably be Long Gully, principally due to its suitability for hidden transmitters and also its proximity to the train service. Everybody is urged to make an attempt to attend, in fact bring a friend and swell the crowd. Hot water and all the necessary facilities for the inner man will be attended to and the only regret is that the committee cannot provide the "eats" as well. The list of trophies is impressive; being to date, three cups, one each from the local commercial broadcasting stations 5KA, 5AD, 5DN, Newton McClaren an 807, Unbehaun and Johnstone a trophy, Healings an extra good slow speed dial, Gerard and Goodman a 6L6, Radio Wholesalers an order for three guineas, Phillips an 807 and Australian General Electric an 807. We are hoping for more so you can see it will be worth while to come along. Watch the W.I.A. page in the "Advertiser" for further particulars. Just in passing the Ham must be held in high esteem in VK5, because it was found hard to refuse double the amount of trophies, but felt we were being treated extra well and did not want to "bite" the dealers for too much.

The fact, as disclosed at the October General Meeting, that "A" class amateur licences were apparently available to Hams without the necessity of sitting for examinations, came somewhat as a shock to the members present. As the hour was late very little discussion was permitted by the chair but judging by the talk among the boys after the meeting, the P.M.G. Department should be flooded with applications for "A" class licences by Hams with qualifications as good or better than those already granted an "A" licence. Preference is a good thing in some instances but not in Ham Radio.

Disposals gear has been very scare in VK5 and were it not for the generosity of the VK3 gang our share would be very poor. The gesture by VK3 division is appreciated by VK5 Hams.

The ultra high position is deteriorating in VK5. The 54 Mc/s. gang has deserted this band for 166 Mc/s. and I am afraid the lure of 14 Mc/s. has caused almost a cessation of activities on " 50 and up."

Mr. H. Roberts (5MY) will again act as code instructor for the new A.O.C.P. classes recently formed.

The tentative opening date for the new A.O.C.P. class has been given as the first Monday in November, but intending students will be officially advised as soon as these arrangements are definite. The appointment of Mr. A. Lum (5AL) as technical instructor is also announced.

## WESTERN AUSTRALIA

**Hon. Secretary: H. B. Lang,**
**42 Ord Street, Claremont, W.A.**

**Meeting Place: Builders' Exchange, St. Georges Ter., Perth.**

**Meeting Night. Third Monday in each Month.**

Since the last general meeting was reported in last month's notes, we are more or less confined to local news and notes. However it will be of interest to local Hams to know that some excellent lectures have been

lined up for future meetings. Make a point of keeping that third Monday as your free night.

**Western Activity**

6KW—Congrats. Ron, our second VK6 WAC fone. His three element beam sure is a fine job as is all his equipment. 6HL—Still spending most of his time on 28 Mc/s. Is trying hard to find a really satisfactory all-band antenna. Latest is vertical folded dipole. Reports very good results. 6DD—Still getting his share of DX. Spending more time on 28 Mc/s. and is also testing on 50 Mc/s. band. 6RU—Not on so frequently of late, but still finds time to be in on the European contacts round 1000 GMT. Will soon have three element rotary on 14 Mc/s. band. 6CM—Very consistent CW operation and doing well. Has nice fist and FB signal. 6MB—Very consistent also. Bill will be devoting less time to radio and more time to cricket from now on. Is one of our first grade cricketers. 6KE—Another new one on 14 Mc/s. CW. Seems to reach out well but has receiver troubles. 6WS—Getting into his stride again. Skipper has new Receiver and can be heard working Ws almost nightly. 6PJ—Peter is landing some good European contacts on 28 Mc/s. Now has close-spaced rotary beam. Is satisfied they work.

6ZO—Heard working Ws frequently on CW. So we have at least one active Port station. 6DF—Now back on 28 Mc/s. and doing well. Has changed his 813 for a single 807. I wonder why? 6EV—Very consistent CW on 28 Mc/s. Has new three element vertical. How's DX John? 6KB—Nice CW signal. Very consistent but on bad spot for CW. Too much fone there OM. 6EL—At Geraldton, is running a three stage rig on 28 Mc/s. ending up with PP 6L6Gs, powered from DC mains (180 volts sometimes) with input varying between 8 and 12 watts. Receiver is converter ahead of BC receiver and has been doing excellent work. At the moment Ern is lining up a rotary beam and I believe hopes to increase power to 20 watts. Thanks for dope Ern.

6WZ—Another Geraldtonite, running 4 watts plate modulated fone to an 807 and doublet 21 feet up. Bruising thumbs and gashing fingers building 32 feet wooden tower. Best DX so far is SU1HF. 6AH—Another of our country members can be heard fairly regularly on 7 Mc/s. band with good fone at good strength. 6WH—Yep, still there keeping 7 and 3.5 Mc/s. bands alive in VK6. What's wrong with 28 Mc/s. these days Ted?. Other stations operating are 6MU, 6MW, 6HM, 6SA, 6RF, 6WM, 6FC and possibly others though not heard. Each week new call signs appear and activity in VK6 seems to be livening up. Conditions in VK6 have been rather peculiar particularly on 28 Mc/s. band, however of late European signals have been excellent from 0900 GMT till as late as 1400 GMT. 14 Mc/s. produces the usual DX plus of course, the inevitable QRM.

**The local boys are thinking of vacating the band since FZR6 seems to occupy 90% of the band and more.**

Here is an example of the "excellent" operation of a commercial station (sez you!) The sooner we get the rest of the band back and crowd him out the better. What do the authorities concerned think of such a transmission? I don't know—you tell me!

## TASMANIA

**Secretary: J. Brown, VK7BJ,**
**12 Thirza Street, New Town. 'Phone W 1328.**

**Meeting place, Photographic Society's Rooms, 162 Liverpool Street, Hobart.**
**Meeting Night: First Wednesday of each month.**

Last month's meeting was held at the University Extensions, Sandy Bay Rifle Range by virtue of the fact that our lecturer for the evening was Mr. G. Fenton, B.Sc., the subject being the Geiger Counter.

A brief council meeting was held at 7.45 p.m., present were Messrs. L. Jensen (7LJ) in chair, J. Brown (7BJ), T. Connor (7CT), A. Finch (7CJ), F. Gee (7RF), C. Walch (7CW), A. E. Allen (7PA). Minutes were read and confirmed and correspondence read and received. Two new membership applications were passed on for general meeting acceptance. The secretary reported the registration under the Company's Act of alterations to Articles of Association. Several letters from members and replies thereto were read, meeting then closed.

At 8 p.m., general meeting took place. Present were as for Council with Messrs. Richardson, Lipscombe, O'May (7OM), Stevens, Lockley, Morrisby (7VJ), Loveless (7ML), F. Medhurst (7AH), Hopwood (7GJ), Koglin, Kelly (7LL), T. Allen (7AL), Conrad (7TR), Nichols (7RY). Clark, Russell (7AC), Conway (7CL), Allenby, W. Watson (7YY), D. Watson (7DW); Visitors: Messrs. Durkin, Rayner, Nicholas, Brown, Russell, Morris, and our lecturer (Mr. Fenton).

The chairman expressed pleasure at seeing our G.O.M. (7AH) present at the meeting and wished him continued good health. Minutes of previous special and general meetings were read and confirmed. Correspondence from F.H.Q. re log books and badges, also disposal matters, and a letter from Western Australian Division re regulations interpretations were read. The VK6 letter caused some very lively discussion. (F.H.Q. correspondence, now in the hands of the Secretary, should clear the air on this matter considerably.) R. K. Kilby (7RK) and D. Hildyard (7DH) were unanimously elected to membership.

A local field day is to be held on the 24th of November and from the preparations reported it seems we are going to have some competition. It is hoped to arrange a State field day early in the New Year, this matter was raised by 7JH who suggested that the Waddamana district could be chosen, it being fairly central. Jack could possibly arrange a visit to the Power Stations as a climax.

The lecture for next meeting is to be given by W. Watson (7YY) on his experiences with shipboard operating. This being all the business the meeting then closed.

The chairman (Mr. L. Jensen, 7LJ), then introduced Mr. Fenton to the meeting and in reply, Mr. Fenton said he was delighted to be present and was interested to note that W.I.A. was having the same trouble with disposals as the University had experienced, he was pleased to hear that we had been able to put Tasmania on the map (referring to the new badge design) applause. Mr. Fenton then outlined the development of apparatus for the investigation of Radio Active Matter from its early stages and illustrated the various devices used from the Gold Leaf Electroscope up to the present Geiger Tube, basis of the Geiger Counter. Several amplifiers of varied design using the ever popular 6J7G were described and the activity of various radio active substances explained, in many cases up to 2000 volts are applied to these valves and it seems they don't mind. The main course of the University's investigations centers particularly on Cosmic Rays and the source of their origin of which little as yet is known.

The lecture was exceptionally well prepared in a lecture room that is ideally arranged, and in moving a vote of thanks to Mr. Fenton, seconded by Mr. D. Watson (7DW), Mr. Jenson thanked him for the great trouble he had gone to and asked him to convey our appreciation to Professor McAuley, Professor of Physics in the University of Tasmania, for the generosity he had shown in making the lecture room available and the lecture possible. This was one of the most outstanding lectures to date as was shown by the way in which the vote was carried. At this juncture members were invited to inspect the Geiger Counter and its associate equipment set up in an adjacent building, small groups being the order owing to space limitations. There a most interesting array was grouped on a bench, a "Geiger Telescope" (two tubes so connected that only rays passing through both tubes actuated the circuit) followed by a 4 stage amplifier to a gas tube operated mechanical counter setup and a C.R.O. visual indicator.

One interesting point brought out at question time was the fact that during the recent Bikini Atol experiments, no change in Radio Activity was noted in Hobart, although barometric pressure showed some changes. The experiments so far have revealed that Cosmic Rays are recorded without any indication of unifomity, not conforming to any particular pattern but appearing entirely at random as was seen on the C.R.O. screen.

7GR recently aspired to phone and putting out FB quality, nice work OM. 7BJ has been flat out with the Quiz Contest hookup on National Network which was such a success. 7ML to be congratulated on a recent new arrival—a boy! 7AL in Repat. under stress of Malaria, says cards are mounting up at QRA but will clear them as soon as possible. 28 Mc/s. is showing some signs of activity in Tasmania again recently.



### SIMPLE HAM RECEIVER.

being wound on celluloid strips and are 1-inch diameter and 7/8-inch long. The 3.5 and 7 Mc. grid coils are wound with 30 g. E. and spaced to cover ¾-inch, the 14 Mc. grid coils and the 28 Mc. osc. grid coil are wound with 20 g. E. and cover ½-inch. All the primaries are interwound at the earthed end of the grid coils, using fine D.S.C. wire obtained from an old R.F. Choke.

| | Aerial | | Mixer | | Oscillator | |
|---|---|---|---|---|---|---|
| | Pri. | Sec. | Pri. | Sec. | Pri. | Sec. |
| 28 Mc. .... .... | 3 | 7 | .... 4 | 7 | .... 2¾ | 3¼ |
| 14 Mc. .... .... | 3¾ | 8¼ | .... 5¾ | 8¼ | .... 2¼ | 7¼ |
| 7 Mc. .... .... | 7¾ | 19¼ | .... 9¾ | 19¼ | .... 3¼ | 17¼ |
| 3.5 Mc. .... .... | 10¾ | 33¼ | .... 14¾ | 33¼ | ....As for 7 Mc. | |

**I.F. Coil**

Sec.—33 turns 30 g. E. 1¼-inch diameter close wound.
Tickler—5 turns 30 g. E. 1¼-inch diameter close wound and spaced 1/8-inch below the secondary.
All coils are wound in the same direction.

**SELECTIVITY.**

used to improve selectivity and while it does help considerably it results in rather poor shape-factor. These figures therefore are quoted to enable the amateur to appreciate the operation of the I.F. channel and perhaps help to explain the lack of selectivity apparent in the use of 1600 Kc/s. I.F. transformers. It must be remembered too that with the exodus to the V.H.F. bands better selectivity will be required than at present if they are going to become like "ten" and "twenty."

The conclusions, therefore, are that improved selectivity, while maintaining the advantages of and in some cases the necessity of a high I.F. frequency, can only be obtained by improved coil design—somewhat remote in the present light—the use of crystal filters and the use of the "double-super." It is hoped to be able to give details of both these at an early date.

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**A VISUAL TUNING INDICATOR EMPLOYING A THYRATRON.**

A Thyratron with AC plate supply is controlled by a grid bias combining an AC supply of the same frequency but different phase and a DC component obtained by rectification of the tuned signal. Change of the DC bias by tuning alters the striking point of the plate voltage cycle and the mean plate current. The current is used to operate a meter or lamp indicator.

(L. S. Joyce, "Electronic Engineering", June, 1946).

## *CORRESPONDENCE*

**Correspondents are requested to keep their letters short and to the point.. The Editor reserves the right to delete anything he may think fit. The views expressed by correspondents are not necessarily those of the proprietors.**

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The Editor, "Amateur Radio,"

We read with interest a small paragraph in the August edition of "Amateur Radio." The paragraph deals with Coils and I.Fs., etc., being spoilt for the proverbial "h'peth of tar."

We take this opportunity of inviting your attention to the mounting of this firm's Coils and I.F. Transformers, which mounting system, we claim, is an improvement over any other known type, together with the fact that all Coils and I.Fs. are, and have been for some time, supplied complete with mounting nuts.

Yours etc.,

AEGIS MANUFACTURING CO. PTY. LTD.

## FOR SALE, EXCHANGE, WANTED

**9d. per line, minimum 2/-.**

**HAMAD**

**FOR SALE.**—Two only ATR2 (CW) transceivers, less power supply, crystal controlled, frequency coverage 3 to 7.5 Megacycles; all new valves, price £10 each. Also three only AR10 battery operated Communications Receivers, less batteries, brand new; complete with telescopic aerial, S meter, B.F.O. and in canvas covered carrying case, operates from 90 v. HT supply and 1.5 v. LT supply, price £15/10/- each. Apply Mr. Hildebrand, 410 Swanston Street, City, Phone FJ 6958.

# PRESENCE OF STANDING WAVES IN WOODED COUNTRY

During a recent test with portable 50 Mc/s. equipment operated from a car, an interesting phenomenon in connection with standing waves was noted. The apparatus in use consisted of a MOPA transmitter using an HY615 equivalent in a TPTG circuit driving an 807 with 1.7 watts input, and an 8 tube super receiver using a 954 RF 954 Mixer and 955 Oscillator. Both transmitter and receiver were connected into a simple horizontal half wave doublet antenna by means of 75 ohms co-axial cable. The radiating portion of the antenna consisted of two lengths of ¼ inch hard drawn copper tubing 3 feet long with lengths of similar 1/8 inch tubing sweated into the ends, the total length of each section being 4 feet 7 inches. These sections were supported on pairs of 1½ inch standoffs near the centre. The antenna, which was maintained broadside to the direction of the incoming signals, was 14 feet high and was secured to the back of the car.

Contacts were made with three stations from the top of a hill 1500 feet high overlooking Melbourne, and 23 miles distant, and signal reports were exchanged. The car was then allowed to roll down the hill on the far side and directly away from the signal sources, which at this stage were transmitting continuous tone modulation. As soon as the antenna had fallen below the level of the top of the hill, i.e. reception was no longer line of sight, it was noticed that the signals dropped about 3 "R" points and then began to surge up and down in a regular manner from this level to about 18 DB down. As this was rather unexpected, measurements were made between the troughs—the latter being more sharply defined than the maximum points, and to within a few per cent the distance was found to be 9 feet—a half wave on 50 Mc/s. For the most part this was maintained with great regularity, but occasionally a trough would be less well defined or even missing. Troughs and crests from the several stations taking part in the test did not co-incide, but were noticeably and regularly "out of phase."

It was concluded that the surges resulted from the presence of standing waves, and as standing waves must be due to reflexions, it appeared that neighboring trees were responsible. Fencing wires and telephone lines were parallel to the road and few in number, and as the irregularities noted above seemed to correspond fairly accurately to large branches, that occasionally overhung the road, it was concluded that the wires were not responsible. The weather was wet, with occasional showers, and the foliage was therefore moist. The phenomenon persisted for one third of a mile until the car ran out into a clearer area where the surges vanished.

The presence of such standing waves may be important under certain conditions at fixed locations where trees or other objects capable of reflecting waves exist, especially if they are in close proximity to the antenna itself. For example with respect to one station the antenna might be on a crest of the wave and the signal therefore strong, while for a second station of identical power, distance, etc., the antenna might be in a trough and the signals a 3 "R" points lower. This may indeed explain certain anomalies already noticed in the reception of stations in the metropolitan area. One station received at the writer's location is never more than R8 although most others are R9 plus from comparable distances. Metal ridging on part of the nearby roof is regarded as the culprit when the antenna is turned in the direction of this transmitter.

Perhaps as well as rotary beams we should instal antennas capable of moving through one half wavelength in any desired direction!—VK3NW.

**QSL BUREAUX.**

is Jock Speer, heard on 80 from the old family location at Corop, Vic. Jock has his old callsign VK3FF but have not noticed that brother Tom has lifted out VK3TS as yet although Tom is well and truly on deck. Jock, whose wife was a W.A.A.A.F. and has operating ability, now has installed AC at the home location and should do well.

VK3XK is again away visiting lighthouses, this time at the Hunter and Three Hummock Islands and Cape Nelson. The weather indicates that Russ should have had a more placid trip this time.

Hams in VK3 country cities and towns willing to distribute QSL's to the locals would assist the QSL Manager by advising of their willingness.

VK3 stations not attending the divisional meeting, and expecting cards, should send a large stamped addressed envelope to the Bureau, 23 Landale Street, Box Hill, E.11.

**TASMANIA**

Non-members as under are advised that QSL cards are available to them at the Bureau on receipt of a stamped addressed envelope: VK7's CA, CF, FL, IL, JT, KR, QZ, XR, ZY. The Bureau address is T. A. Allen, 6 Thirza Street, New Town.

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According to RCA's "Relay" the Chinese went to a lot of bother in overcoming their paper shortage. For example after running receiving tape through an inking recorder they turned it around, top for bottom, and ran it through again using a different colour of ink. Two more runs could be made after it was turned over on the other side. Then they rewound it and ran it through a perforator and into a transmitter head. Five runs for one piece of tape! . . . . . That's really saving paper . . . . QST.

# MACHINING POLYSTYRENE.

We are indebted to Messrs. Etholex Plastics for the following information in connection with the working of Polystrene. "Stylon" is the name under which Messrs. Etholex Plastics market Polystrene.

"Stylon" can be easily machined on standard equipment provided the correct technique is used. This thermoplastic material begins to soften at about 180 deg. F. and because it will become gummy, at about 230 deg. F., excessive heating during all machining operations must be prevented. When overheated, even if gumming does not occur subsequent cracking and surface crazing is possible.

By avoiding excessive friction, aiding chip removal and when possible using a coolant, no difficulty will be encountered whether using hand tools or high speed automatic equipment. "All tools should be kept sharp and free from knicked or burred edges."

**Coolants.**—Water, or soap and water are the most satisfactory cooling lubricants for any machining operation. Tallow, soap or methylated spirits have also been used on equipment not fitted with automatic lubricating devices.

Petrol, kerosene or mineral oils should never be allowed to come in contact with "Stylon" as they tend to soften it.

**Cutting.**—A hacksaw can be used but the process is slow and the material will tend to overheat and the saw to stick. To avoid any local overheating and subsequent cracking due to surface strains introduced, the saw should be freely lubricated with water.

For high speed production, any band or circular saw as used for wood may be employed but a hollow ground circular saw is desirable. It should be 3/32-inch thick to avoid vibration. When cutting material less than ¼-inch thick, a saw with 12-15 teeth per inch is used.

Heavier sections are best cut with a 9-inch diameter saw having 8-10 teeth per inch running at 2,000 r.p.m. and freely lubricated with water.

**Filing.**—Clean, sharp files with fairly coarse teeth are best. Overheating can be avoided by dipping the file in water occasionally, this also assists the removal of chips and produces a finer finish.

**Drilling.**—With ordinary care, standard twist drills can be used successfully. Drills ground for hard metals have a tendency to pull in to the material and cause grabbing in much the same manner as with copper and aluminium. This may be overcome by using drills modified to the following specifications. Flute angle 15-17 deg., lip angle 70 deg., lip clearance 4-8 deg. A general guide to speeds is as follows:—

1/16-inch diam.—7,000 r.p.m.
1/8-inch diam.—3,500 r.p.m.
1/4-inch diam.—2,000 r.p.m.
3/8-inch diam.—1,200 r.p.m.
1/2-inch diam.—1,000 r.p.m.

Water, or soap and water should be used as a lubricant and the drill backed out frequently to remove chips.

**Turning.**—Etholex Polystyrene can be readily turned, excellent results are obtained by using standard high speed tool steels, a large clearance and very slight or even a negative rake are best, the cutting edge should be 5 deg. below the horizontal centre of the work. For heavy cutting and internal boring water lubrication is essential.

**Milling.**—Standard milling machines are used when a high degree of accuracy is required. Cutters having low side friction are desirable.

Wood sharpers and routers are much faster and will give excellent results on both contour and step cutting. Cutters should be cooled with water or by using an air blast.

**Threading and Tapping.**—Standard taps and dies may be used, coarse pitch threads are preferred because of their added strength, care must be taken to remove chips frequently. Use water as a lubricant.

**Polishing.**—A soft cotton buff 10-inch in diameter, running at 500-800 r.p.m. will give the best results. Scratches and other surface marks are readily removed if the buff is "dressed" with tripeli compound. A high lustre is obtained by finishing with a dry clean wheel.

Local overheating due to excessive pressure or keeping the buff on the one position for too long a period will cause surface crazing.

**Assembly.**—At atmospheric temperatures, "Stylon" should never be deformed more than ½%, therefore screws tapped into holes should not be more than hand tight. "Stylon" cement should be applied to the screw if it is necessary to prevent loosening caused by vibration. When attaching flat panels to a frame, care should be taken to avoid bending the panel and if bolts are used, they should be placed so that the load is evenly distributed. Cork or rubber gaskets will aid in distributing the pressure.

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Brown areas on the screens of cathode ray tubes employing electro magnetic deflection and electro static focusing are eliminated by the use of ion trap gun now being incorporated in the tube such as the DuMont 10BP4.

Ions which are much heavier than electrons are also emitted by the tubes cathode. They are practically immune to deflection by magnetic fields of the intensity generally used and consequently bombard the centre area of a cathode ray screen causing its disintegration. The ion trap is mounted around the neck of the tube before the focus coil and it separates the ions from the electron stream by means of combined magnetic and electric fields. . . . . QST.

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Vectolite the first non-metallic and non-conducting permanent magnet material ever made has been announced by G. E. It is a hardened dross like combination of iron dust and Cobalt oxide mixed when still in powder form. Permanent magnets of Vectolite are light in weight prevent electrical losses due to current induction and are highly resistant to de-magnetising forces. . . . . QST.

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## AN AUTOMATIC OSCILLOGRAPH WITH A MEMORY.

This instrument has a flat response up to 30 megacycles, and can be used for problems concerning randomly occuring transients. Three cathode ray tubes allow simultaneous indications of interrelated quantities. The screens which have a long afterglow are continuously excited and the occurance of a transient pulse releases a camera shutter and interrupts the beam so that events prior to the photographic exposure are recorded. Illustrations of sporadic disturbances in mercury arc rectifiers are given. The system is completely automatic and 40 photographs can be taken without the aid of an operator.

A. M. Zaren, (Trans. American Institute E.E.), March, 1946.